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MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

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MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

EDITED BY

GEORGE CROOM ROBERTSON,

PROFESSOR IN UNIVERSITY COLLEGE, LONDON.

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MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

I.—THE QUESTION OF VISUAL PERCEPTION IN GERMANY. (I.)

IMPARTIAL readers of recent English discussions of the space-question will be ready to admit that there is still ample room for more than one theory of the subject. Some years ago it was commonly thought that, thanks to the arguments of the Berkeleyans aided by the experiments of Wheatstone and others the derivative nature of visual space was amply demonstrated. Yet the skilful rehabilitation of the opposite doctrine by Bailey proved, as J. S. Mill allowed, how great the difficulties are which still beset the problem. More recently the ingenious arguments of what may perhaps be called the Dublin school, including Messrs. Abbot, Monck, and Mahaffy, have shown that the theory of visual space is even now far from being finally determined.

In Germany the same unsettled condition of the problem meets us. Indeed the division of opinion is even more strongly marked in that country than in our own. English writers on the whole have followed the direction indicated by Berkeley, who may be said indeed to have given shape to the problem in our country. In Germany, on the other hand, the discussion of the question received its initial impulse from the opposite side, namely, from the peculiar intuitional doctrine of Kant. And this fact explains why the intuitive or original view has been so ably represented in German writings. On the other hand, however, the influence of Berkeley and generally of the analytic English psychology has made itself felt in the German discussions, and at present it may be said that the derivative view of space is quite abreast, if indeed not in advance of, its rival.

The field in which the space-question has been most warmly discussed is that of visual perception. This domain is clearly not one of pure psychology (in its narrow sense as a subjective science), but to some extent comes under the control of physiology. It offers ample territory for exact objective observation, and for skilfully arranged experiment. Accordingly one finds that in Germany it is the physiologists who have done most to advance the question of the nature and origin of visual space.

The immense advantage that the co-operation of these workers has secured is the accumulation of a large mass of new material which the psychologists of the future will have to work up in their theoretic constructions. Of the nature and extent of this material it is my chief object to give some account in this paper. It consists of observations and experiments which, being carried out by men trained in the conditions of accurate scientific data, is worth unspeakably more than the rough personal observations which used to be put forward as a sufficient groundwork of a psychological theory of space.

It will naturally be expected that such workers, having to deal with so complicated a set of phenomena, and not being specially trained in psychological interpretation, would, as soon as they began to theorise on their facts, reach very different results. What most strikes one, perhaps, in going over the recent literature of the subject is the number of seemingly distinct hypotheses set up in explanation of the phenomena. Closer inspection, however, shows that the diversities are often little more than verbal. Further, a free exchange of criticisms has served both to diminish the points of difference, and to reduce the number of the competitors whose claims are worth serious consideration.

I propose in the present paper to give a very brief sketch of some of the principal results of recent researches in physiological optics which bear on the nature of the visual perception of space. So far as possible I shall confine myself to facts, only giving such immediate conclusions from these as seem to be indisputable. In a second paper I hope to indicate the various ways in which the representatives of the different theories seek ultimately to interpret the facts.*

First of all, then, let us inquire what has been done of late to elucidate the nature of the eye's perception of space-relations in two dimensions, namely, relative direction, magnitude, and figure. We will first of all consider these properties as perceived by the single eye. The appreciation of them in binocular vision is a subject so intricate as to call for a special discussion later on.

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* I am indebted for most of these facts to Helmholtz's classical work *Physiologische Optik.* Next to this Wundt's elaborate treatise *Physiologische Psychologie* has proved most useful.

If we ask what are the means at the disposal of the eye in its construction of space, we find that these consist of two and only two modes of sensibility. The first of these is what is known as the discriminative local sensibility of the several nervous elements which compose the sensitive layer of the retina. It must be admitted that in the mature eye a peculiar local interpretation belongs to all impressions falling on the same retinal elements.* What the ultimate nature and the origin of this sensibility may be, is a question which must for the present be postponed. The second mode of sensibility which, as is now generally admitted, is involved in these perceptions is that which is variously known under the name of the muscular sense, feeling of innervation, and so on. There are a number of feelings attending ocular movement and the action of the ocular muscles. Of these the chief are those which accompany the actual movements of the eye, and which vary according to the direction and range of these movements. The question of the precise nature of this motor and muscular sensibility will have to be dealt with under the head of theoretic interpretations.

By help of these two orders of feeling, the eye gives local order to its impressions in respect of the relative position of points, lines, &c., their distance from one another, their magnitude, &c. In other words, by these means it is capable of conceiving the position of points, &c., in two dimensions.

Had we no other knowledge than this we should assign no particular distance to objects, nor would the surface on which we projected them have any particular shape. With our mature ideas of space, we cannot, it is clear, conceive what our space-intuition would be under these circumstances, though we may gain a faint imagination of it, perhaps, by thinking of the space-ideas of microscopic creatures living on the surface of a sphere, and knowing only points, lines, &c., lying on this surface.

It is sometimes said that from the first we tend to project retinal impressions on to an imaginary concave surface. Thus it is said that from the first children conceive the sky as the inner side of a hollow sphere. Yet it must not be supposed that our perceptions of the relative position and distance of points (or lines) would involve any such conception. The notion of a hollow sphere belongs to our complex mature space-consciousness, and our interpretation of the sky as a cupola may be explained as the resultant of many experiences.

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* Strictly speaking, this varies with the position of the eye. I assume here that the eye remains in one and the same position.

In investigating what has been done to clear up the conditions of this side of our space-perception, we naturally begin with the discriminative sensibility of the retina. Careful observations have been made in this region by E. H. Weber and others, corresponding to the celebrated researches conducted also by Weber in the domain of tactual sensation. It appears from these that, in the case of a practised eye, in the area of perfect vision (the yellow spot) two points are distinguished when the visual angle reaches 60-90 seconds, or when the retinal image has a magnitude of 0·004-0·006 millimetres.

The discriminative sensibility is less fine as we pass from the centre to the peripheral regions of the retina; and, what is more curious, this falling-off takes place more rapidly along certain retinal meridians than along others. Thus it is less rapid in the horizontal than in the vertical direction. (Aubert & Förster.)

It seems probable that the cones, which are much more numerous in the area of the yellow spot than elsewhere, are the ultimate sensitive elements of the retina. It is a question, then, what relation exists between the minimum of local discrimination and the magnitude of the cones. This point is not yet settled, owing to the conflicting results of the measurement of these elements by different observers.*

The decrease in discriminative sensibility towards the periphery is explained by the comparative sparsity of the cones. It seems probable that over and above this circumstance, inequalities in the exercise of the different retinal regions have an influence here. It is to be supposed that just as special practice is found very considerably to increase the power of discrimination in the yellow spot, so the customary exercise of the eye would tend to render the sensibility of the central still more delicate than that of the peripheral regions.

The results of the defective observations reached on this whole subject point to the conclusion adopted by Wundt, that the local discrimination of the retina is somehow limited by the size of the ultimate nervous elements, though additional attention and practice may effect a considerable increase of sensibility within these limits.

* Helmholtz, leaning on measurements of Kölliker, argues that the minimum retinal interval of distinguished points must be greater than the diameter of a cone. Wundt, following the measurements of H. Müller and Max Schultze, thinks that impressions may be distinguished which fall within the area of a single cone, and that this is effected by the help of the distinct fibrils which issue from one and the same cone.

We may now pass to the second elementary factor in the visual construction of space, namely, ocular movement.

The eye is rolled about its centre by means of six muscles. So far as a mere inspection of this mechanism would tell us, we might suppose that the eye's axis could be moved from any given point in the field to any second point by different combinations of muscular contractions. In point of fact, however, it is found that these movements are invariably carried out in one particular way. Thus it was found by Donders that to a given position of the eye's axis relatively to the head, there belongs a certain and invariable amount of rotation about this axis. In other words, whenever the eye fixates a particular point in the field (no matter from what other point it has moved), the various regions of the retina preserve the same relative arrangement.

Once more, it has been found by Listing that when the eye sets out from a certain 'primary position,' in which the principal axis is directed to the point of the field immediately in front of the eye, there is no rolling about the axis at all. In all such cases the movements are the same as if the eyeball rotated about an axis lying in the vertical plane which we may imagine to divide its anterior and posterior hemispheres.

There are two ways of regarding these uniformities of ocular movement. According to Wundt they answer to the least expenditure of muscular energy, and are conditioned by certain innate arrangements of the muscular mechanism.

On the other hand Helmholtz argues that these laws are to some extent the result of the individual experience. He has succeeded by the use of prisms, which impose unwonted conditions on binocular vision, in producing abnormal combinations of axial movement and rotation about the axis.

These views may be reconciled by the supposition, put forward by Wundt, that there is an innate disposition to the habitual or normal combinations, though this is itself the result of the collective experience of the race.

Some of the more obvious results of these laws in relation to visual perception are the following. First of all it follows from Donders's law that, whenever the eye returns to a particular point of the field, a fixed object in this region will be pictured on the same retinal elements. Now it is certain that the experienced eye perceives form when at rest and by help of the varying local sensibility of the retinal elements. It must follow, then, that so far as the eye appreciates form through a number of simultaneous retinal impressions, it will have an advantage in rotating as this law defines, since it will be able to return an indefinite number of times to an object at rest, and to receive from it a perfectly similar group of retinal impressions on the same nervous elements.

The implications of Listing's law are still more important in relation to our present subject. It follows from this law that when the moving eye traces a line immediately in front of it, it necessarily receives the image of the line on the same series of retinal elements or the same retinal meridian.* That is to say, the nervous elements excited by any two successive impressions of the lines will for the greater part be the same, only a few of the old elements being dropped and new ones taken up. Consequently any deviation from a perfectly rectilinear direction in the line would (so far as this is appreciated through retinal sensibility) at once make itself felt through this intrusion of a new nervous element falling outside the meridian. It follows then, that, so far as the eye appreciates form through retinal sensibility alone, it will be much better able to estimate the straightness of a line which lies immediately in front of it than of those situated elsewhere.

Observation bears out this conclusion. When we want to tell very nicely whether a line is straight, we half instinctively bring it exactly in front of the eye so that its centre coincides with the principal point of fixation, and then let the eye wander up and down it. In this case the appreciation of rectilinear form is very delicate.†

Another consequence of Listing's law is that when the eye (the head being supposed to be fixed) moves from the primary position over the field in different directions, certain fixed lines in the field will necessarily be pictured on the same retinal meridian.‡ This applies to all parallel lines lying in the central portions of the field. It would seem to follow that so far as retinal sensibility is involved there will be an advantage in appreciating the direction of parallel rather than of any other lines in these regions. Further, one may deduce from this law that it will be much easier to measure the length of two parallel lines than of two diverging lines, since in the former case the successive images may be made to fall on exactly the same series of retinal elements.

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* Strictly speaking this holds true of all lines, straight or curved, which cover or could be projected on any one of the great circles of the concave field which intersect at 'the principal point of fixation' immediately in front of the eye.

† This is true even when the eye is at rest. This would be explained by the supposition that the elements of one and the same meridian (in the central regions of the retina) have their discriminative sensibility sharpened by the exercise involved in these habitual and critical movements. Of this more hereafter.

‡ This is true of all lines whose projections on the concave field correspond to circles which intersect at 'the occipital point'—an imaginary point supposed to be situated behind the head, and answering to the principal point of fixation—and which at this point of intersection touch one and the same meridian of the field.

These conclusions, again, are fully corroborated by observation. The eye is able to detect very slight deviations from a parallel direction in pairs of lines when these lie opposite the eye in the central regions of the field. Again, it detects inequalities between lines much more easily when they are parallel than when they have different directions. Once more, the magnitudes of angles with parallel pairs of lines are compared much more exactly than those of angles contained by non-parallel pairs of lines.

One further consequence deserves to be mentioned. We are able to appreciate form to some extent in indirect vision. It might be conjectured from what has gone before that the relations of points and lines implied in the forms of objects thus viewed will be better appreciated when they are so situated that their images may successively be received on the same retinal elements. This seems to be so far borne out that with the eye at rest we can pretty accurately appreciate the inequality of two parallel lines in the central field, though the comparative measurement of two lines having unlike directions is liable to be far from exact.

The most striking fact, however, in this indirect visual appreciation illustrative of the law of movement now discussed is the following. When the eye moves from its primary position to a point far out in the peripheral region of the field a really vertical or horizontal line is no longer imaged on the same retinal meridian as lines of the same direction in the central regions. How then, it may be asked, does the eye at rest regard such lines in these outlying portions of the field? Curiously enough, under these circumstances it estimates form in relation to the impression which would be made on the central area of the retina if the eye were moved to the object. Thus a line actually vertical appears in indirect vision inclined and *vice versa.* As soon as the eye fixates the line the illusion disappears. This fact is of great interest as pointing to the secondary or derivative character of the eye's indirect appreciation of form.

I have hitherto assumed with Helmholtz that in these appreciations of form and magnitude the discriminative sensibility of the sensory elements of the retina takes part. At the same time it is to be observed that in all cases of successive comparison in direct vision the sensibility connected with the eye's movements may be the ground of judgment as well. Thus, in comparing the length of two parallel lines it may be said that the perception rests on the motor or muscular feelings which accompany the eye's movements along each of the lines. In truth there are facts which seem to prove that this is actually so. E. Hering has in a recent work, *Die Lehre vom Binocularen Sehen,* attempted to show that within certain limits in the centre of the field a movement along a line is carried out from first to last by the same muscles; further that under these circumstances the muscles employed work in the same ratio of intensity from the beginning to the end; and finally that owing to the particular arrangements of the muscular apparatus all parallel movements within these limits are effected by the same muscles pulling in the same ratio of force. These facts, if fully established, are of the first consequence for the understanding of the eye's appreciation of form. They would serve to explain its peculiar delicacy in the estimation of straight lines, and in the comparison of the directions of parallel lines (and so of the magnitude of angles contained by parallel pairs of lines), solely on the ground of muscular sensibility.

There seems, then, to be two equally good ways of explaining these facts. Since movement accompanies nearly all our perceptions of the direction and magnitude of lines, we may suppose that muscular sensibility commonly takes part in these judgments. At the same time it is certain that some of these judgments are carried out by means of simultaneous impressions, the eye being at rest and fixating the centre of the line. Thus the differential sensibility of the nervous elements is a fact which must be accepted and accounted for.

Yet though this sensibility must be supposed to enter into our judgments of relative position and magnitude, it by no means follows that it is superior in delicacy to the motor feelings. Wundt argues on the contrary that the finest discriminations of magnitude are only possible by help of ocular movement. According to the experiments of Volkmann and Fechner, the eye's discriminative appreciation of linear magnitude follows within certain limits the latter's psychophysical law. That is to say, the minimum difference perceived is a pretty constant fraction of the length of line compared.* Below a particular limit, however, this relation no longer holds good. Wundt argues very ingeniously that this 'threshold' is imposed not by the area of the retinal elements, but by the limits of discriminative motor sensibility.

Wundt considers that the influence of the motor feelings (which he calls 'feelings of innervation') on the visual appreciation of form and magnitude is illustrated in many of the well-known optical illusions respecting relative direction and size. These he seeks systematically to refer to peculiarities in the process of innervation involved, and its attendant feeling. Thus it is known that we over-estimate vertical magnitude relatively to horizontal. This arises, says Wundt, from the fact that horizontal movements are executed by a single pair of muscles (rectus externus and internus), whereas vertical movements involve two pairs (rectus superior and inferior and the two obliqui) which oppose one another in a certain measure.* Hence a greater muscular strain, and so a greater feeling of innervation, in the latter than in the former instance. Similarly the error made in over-estimating magnitude in the upper as contrasted with the lower regions of the field, and in the outer as compared with the inner regions, is referred to differences in the degrees of innervation involved.†

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* This fact does not tell, so far as I can see, in favour of either sensibility, since Fechner's law is known to apply both to the intensive and the extensive magnitude of sensations.

While Wundt thus emphasises the influence of the feelings of movement in monocular appreciation, Helmholtz calls attention to the effects of past experience. Thus he would explain our disposition to over-rate the magnitude of the vertical direction relatively to that of the horizontal by the fact that by far the largest number of forms compared in daily life coincide with the plane of the ground,‡ and consequently have their upper portion further from the eye than their under, so that the vertical is foreshortened. Owing to this prevailing experience we acquire the habit of interpreting the vertical dimension as larger than it directly appears.§

The co-operation of ideation or of imagination based on experience, is illustrated still more distinctly in the filling-in of the lacuna in the visual field answering to the blind spot in the retina. Volkmann has called attention to the fact that when the lacuna falls on the printed page of a book, we fancy at first that we see letters within the limits of the lacuna.

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[*] Wundt holds that rolling about the axis is prevented by an antagonistic action of the combining muscles (*e.g.* the superior rectus and obliquus).

[†] He thinks that since in transverse section the upper muscle exceeds the under in calibre, and the inner the outer, a smaller degree of innervation is required. Wundt's attempt to reduce all the well-known cases of illusory measurements (including Zöllner's pattern) to special moments in the feeling of innervation is ingenious though somewhat forced. On the other hand, Helmholtz's explanations hardly seem more satisfactory.

[‡] The reason for this prevailing mode of viewing forms is to be found later on.

[§] Another fact differently interpreted by these two observers is that a line drawn precisely vertical to a given horizontal line appears to be slightly inclined. The meaning of this will be best discussed later.

The illusion disappears with a concentrated effort of attention. The phenomena of the blind spot show incontestably that our visual perception of space-relations is to some extent a process of inference or of imaginative construction out of remembered elements of previous experiences. We fill the gap in the field with ideal impressions, which the eye would receive were it to fixate this particular region.

Let us now pass to another aspect of our visual intuition of space. So far I have spoken of relative direction only, or the position of points in relation to one another. It is a different question what determines the eye's judgment of the absolute direction of objects in the field, *i.e.*, their position relatively to one fixed starting point. This standard of direction is clearly our own position in space. When we refer an object to the left or right of the whole field over which our moving eye wanders, we assign it a position relatively to that of our own body.

This absolute direction is known in monocular vision when the position of the axis of vision (principal axis) is known. The several parts of the total field over which the eye travels (the head being supposed to be fixed) are all projected in different directions. As soon as we know the absolute direction of any one of these successive lesser fields we are able to fix the direction of any particular object in this region in relation to this fixed direction as centre. Accordingly what we have to find is the eye's means of determining the absolute direction of any given partial field, in other words, any given centre of fixation.

Our perception of direction depends, as abundant observation shows, in part on the motor feelings of the eye. In every movement of the organ upwards or downwards, to the right or to the left, and so on, some peculiar shade of motor feeling arises. Moreover each of these modes of feeling varies with the range of the movement executed. The different feelings attending these varieties of movement are the ground of our projecting impressions in this or that direction.

That the motor feelings do thus serve as the ground of judgment is proved, as Helmholtz says, by the simple experiment of closing one eye and pressing the other inwards with the finger. The result of this is that objects appear to move inwards too. The explanation of the phenomenon is that since in this case there is a transference of the retinal picture to new elements without any consciously executed ocular rotation, we ignore the passive movement of the eye-ball and infer that objects have shifted their position in the opposite direction to that of the retinal image.

In this connection the effects of a paralysis of the ocular muscles are highly instructive. If the external rectus of the right eye (or its nerve) is completely paralysed, every effort to move the eye outwards (which is of course futile) is attended with an impression that objects are moving to the right. Here the feeling of motor innervation misleads the patient who, supposing that his eye has actually moved outwards, infers that since there has been no shifting of the retinal picture objects have followed the eye. If the paralysis is partial, there is still an error in the perception of direction which shows itself as soon as the patient attempts to seize an object.

Closely related to this point are some of the phenomena of giddiness. The apparent movement of objects in this condition is in certain cases explained by help of the motor feelings. When we have for some time followed objects moving in one direction, as when sitting in a railway carriage we follow the apparent backward movement of the objects near the railway, our eye continues for some time to move in the same direction though we are quite unconscious of the movement.* If now we try to fixate some object at rest, our eye in reality passes across it, and the result of the unconscious ocular movement is interpreted as a movement of the object in the opposite direction, namely that of the train's motion. In other words, in this case as in that of pressing the eye-ball, what is ignored in ocular movement has to be interpreted as a movement of objects in the opposite direction.

But how, it may be asked, do we perceive direction when the eye is at rest? To explain this, we must have recourse to another side of muscular sensation. Not only does actual movement yield a certain consciousness which is known as the feeling of movement: any muscular tension when not leading to movement affords a particular mode of feeling also. Thus whatever the position of the eye relatively to the head, there belongs to this position a particular state of muscular contraction, and, as the concomitant of this, a particular shade of consciousness. To quote Hering: "The innervation and the muscular action corresponding to this is a one-valued function of the situation of the point of fixation in the field". We may naturally suppose that the primary position being that in which the muscular tensions are equalised, and so the natural and normal position, serves as the customary standard of direction. The feeling attending this condition of the muscles serves as a basis of our judgment of the leading direction, namely the front. Any other position of the eye-ball will be estimated as a deviation from this normal position.

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* That the eye does thus actually continue to move after we cease to be conscious of the movement, may, says Wundt, be directly perceived by an 'objective observer'. Why do we cease to be conscious of the movements of the eye in these cases? Helmholtz argues that after following objects moving in the same direction for some time, we come to look on the required motor innervation as that proper to a fixation of the eye. In other words, the muscular feelings by which we estimate a state of fixation of the eyes become obscured. Wundt holds that this is no adequate explanation. He considers that not only the actual movements of the eye but also the extraordinary efforts to counteract these movements and to fixate the moving object (which efforts are continually thwarted by the invincible tendency to follow the object) affect our judgment here. By over-estimating these futile impulses we both under-estimate the velocity of the moving objects, and afterwards overlook the slight amount of movement due to the momentum so to speak which the eye has acquired.

So far we have supposed the head to be fixed. When the head moves the sense of direction is of course more complicated, the feelings which accompany the contraction of the muscles of the neck being now a factor in the judgment.*

Finally it is to be observed that according to recent researches the apparent direction of objects may be affected by those feelings which yield us the general consciousness of our bodily position or attitude. Thus the apparent movement of objects after rapid rotation of the body (as in dancing) is now attributed not to unconscious and misleading movements of the eyes relatively to the body, but to a perverted sense of how the body stands.†

The position of the head and of the eye-ball being thus known through motor feelings, our judgment respecting direction is determined by the special local sensibility of the several retinal fibres. Impressions falling on particular elements are projected in the direction of the optic axis (*i.e.*, the axis of the bundles of rays which converge on the different retinal elements). That this projection in the case of the experienced eye is immediate and unavoidable is seen in the fact that we continue to project subjective after-images (spectra), and the sensations of light caused by pressing on the hinder parts of the eye-ball, in the direction of the axis even when we are fully aware that no objects answering to these perceptions exist in these quarters.

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* The appreciation of the position of the head is found to be more exact in the light than in the dark. According to an experiment of Aubert, we under-estimate the amount of rotation of the head in the dark. This shows that the feelings yielded by the muscles of the neck are vague and insufficient, and that under ordinary circumstances we estimate the position of the head in part by differences of optical impressions, namely, the shifting of the image of the visible parts of our own body.

† Helmholtz thinks we deceive ourselves in these cases as to the exact moment in which the body ceases to rotate. The researches of Goltz and Crum Brown render it probable that this confused sense of the bodily posture after rotation is due to disturbances in the normal pressure of the fluid contents of the ampullæ of the ears, the feelings attending which play a prominent part in the maintenance of the equilibrium of the head and with it that of the body.—See Ferrier's *Functions of the Brain*, p. 60.

If the direction of the rays impinging on the retina is artificially altered the result is an apparent shifting of the visual object. This may be illustrated by covering the eye with a glass prism in such a way that the edge or angle of refraction shall be vertical and to the left. Under these circumstances the objects of the field appear to be shifted to the left.

It might be supposed that the single eye's perception of direction depends exclusively on the two conditions just spoken of, namely, the feelings of motor innervation and the special local sensibility of the different nervous elements of the retina. But recent experiment has shown that yet another factor contributes to this judgment. Hering has made the following observation:—The two eyes first fixate an object infinitely distant, so that the principal axes have a parallel direction. If the right eye be then closed and the left eye preserve its direction, the object appears exactly as before. If, however, the left eye be now accommodated to a nearer point in the same line of sight the object appears to shift to the left. The retinal image has in this case undergone no change of place, and the only new element introduced by the accommodation is the movement of convergence in the closed eye. It follows from this that when we judge of direction by one eye the position of the closed eye helps to determine the judgment. To quote Hering—"The direction of vision is the same for the left eye, the right eye, and the two eyes" (*Beiträge*, p. 28).

Helmholtz has found that a precisely similar relation between the open and the closed eye exists with respect to rolling about the axes. When the two eyes, after having a parallel direction, are made as before to converge towards a point in the line of sight of the open eye, a line which before appears horizontal seems to undergo a rotatory movement about its centre. The various meridians of the retina of the open eye do not in this case undergo any rotation, and the change in the apparent direction of the line is due to the rolling of the closed eye. These facts are gathered up by Hering and Helmholtz under the figure of an imaginary cyclopean eye placed midway between the two eyes and fixating the common point of fixation of the two eyes. If we suppose the retinal images to be transported from one of the actual eyes to such an eye so that central point (fixation-point) falls on central point, and retinal horizontal meridian on horizontal meridian, then "the points of the retinal image are projected outwards in the line of direction of this imaginary cyclopean eye".

Helmholtz connects these curious facts with the circumstance that our normal customary vision is binocular, not monocular, and that we learn from experience to estimate direction not in relation to the single eye but in relation to the median plane of our body which supports the organs of movement. That the monocular perception of direction has for its fixed starting-point the median plane of the head, coinciding with that of the nose, may be proved by means of the following experiment. I fixate with one eye a distant object and cover the lower part of the field, including the hands and arms, by means of a sheet of paper. If I then lift my forefinger behind the paper and try to bring it in the line of the object, the finger will come into view somewhat left of the object when the right eye is used, somewhat right of the object if the left eye is used. An exactly opposite result occurs when the object is near and the finger rises behind it. In all these cases, as Hering says, we refer the object to the root of the nose, and place the finger in the line uniting this point and the fixated object.

The perception of direction in binocular vision, which this experiment shows to be the normal one, is assisted by the motor feelings which accompany the combined movements of the eyes.

Of these combined movements it is unnecessary to speak very fully here. As the reader knows, they are determined by the prime necessity of binocular vision, which is the simultaneous reception of an image of the object to be viewed on the area of perfect vision (the yellow spot) in each retina.

It is an interesting question how far these combinations are fixed from the first by certain mechanical arrangements. That they are modifiable within certain limits has been shown by Helmholtz, who succeeded in making the axes divergent and in giving them different elevations when by certain artificial arrangements these positions were necessary for distinct conjoint vision by the yellow spots.*

Returning now to the perception of direction, we infer from the observations already made that in binocular vision the eyes do not separately estimate the direction of an object in relation to themselves, but that they each estimate it in relation to a point midway between their centres of rotation. The supposition that each eye projects its retinal impression along the line of the optic axis appears to rest on the fallacious assumption, that when we look at objects we are conscious not only of the position of the retinal picture but also of the course of the incoming rays. But of this more will have to be said by and by.

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* The first deviation may be effected by a stereoscopic arrangement in which by interposing two prisms the centres of the pictures could only be fixated by diverging axes. The second deviation is brought about by holding a prism before one eye with its angle of refraction uppermost.

In binocular vision, then, absolute direction is clearly estimated by the sum of the motor feelings arising from the movements of the two eyes. In moving the eyes from one point to another the amounts of movement executed by the two eyes are not always equal. Thus the movement described in Hering's experiment involves a movement of one eye only. So when the axes are directed to a point very far to the right or to the left a movement to a new object involves a larger sweep of movement in the nearer than in the further eye. It follows then that in judging of direction we are somehow conscious of the amount of movement executed by each eye, and estimate any given change of direction by means of the sum or combination of these feelings.

Before leaving the subject of direction I may refer to a curious experiment of Helmholtz which illustrates the relation of the perception of direction by the eye to that by the organs of touch and movement. How this relation is to be conceived will of course vary according to the general theory of the space-intuition. Of this more will be said hereafter. That the two modes of perception agree is incontestable. Helmholtz has shown how they can be made to disagree and afterwards be re-adjusted. He placed two prisms in the frame of a pair of spectacles with their angles of refraction turned to the left. Objects looked at through these appeared shifted to the left. He then fixated some particular object, shut his eyes, and tried to reach the object with his forefinger. He found of course that the finger passed to the left of the object. When, however, the trial has been repeated a number of times, and still more quickly after the hand is brought into the field and its movements guided by the eye under the new circumstances, the attempt to reach an object is successful. If, further, when this stage is reached the prisms are taken away, an object is fixated, and another attempt is then made with closed eyes to reach it, the finger misses the object, now passing to the right of it.

One other result of the experiment deserves to be named. Even when in re-adjusting the movements of the hand to the new and artificially changed visual impressions only the right hand has been employed, it is found that the left hand is at once capable of executing the required movements.

It might be supposed that the sense of direction is absolutely determined when once the movements and positions of the eyes are known. Yet it appears that experience may so far influence our judgment as to cause within certain limits an apparent change of direction of an object when there exists a powerful disposition to think of it as moving. Thus, for example, to refer to an observation mentioned by Wundt, when we look at the clouds flying over the moon we instinctively attribute the movement to the moon. The reason of this is, as Wundt says, that we are constantly seeing small objects move, rarely large objects.*

It has been assumed here that in binocular vision the direction of an object is the same for each retina. This is not invariably the case for objects seen in indirect vision. The exceptions to the rule will have to be spoken of presently when we take up the subject of double vision.

Let us now pass to the second element in the binocular perception of space, namely distance, or as the Germans say, depth. The distance of an object is estimated either relatively, that is in relation to some other object, or absolutely, that is according to some constant standard. We will first touch on the perception of relative distance.

In appreciating a very minute distance between two objects there are two conceivable elements on which our judgment may be based. In the first place the optical axis may remain fixed. In this case the perception will rest exclusively on the difference in the relative positions of the parts of the two retinal pictures due to the inequality of distance of the corresponding object-points. In the second place the eyes may be supposed to move from one point to another, and so the perception of difference in distance to arise through a change in the feeling of convergence. Helmholtz adopts the former supposition. He dwells on the delicacy of the discriminative sensibility of the elements of the two retinas as seen in stereoscopic perception. Thus, for example, two successive impressions from a printing press when stereoscopically combined give a perception of words and letters lying before and behind one another, the reason of this being the introduction of very slight changes in the distances of the letters from one another in the two impressions. Helmholtz has also measured the limits of this discriminative sensibility by means of an experiment which I have elsewhere described (*Sensation and Intuition*, p. 55), proving that the delicacy of the discriminative sensibility of the two retinas is precisely the same as that of a single retina. That is to say, a displacement of the image of one retina relatively to that of the other is recognised when it amounts to the minimum distance between two retinal images which is recognised as such by the single eye.

* Of course the allusion disappears when we steadily fixate the moon.

On the other hand, Wundt in his latest work, when giving the results of certain experiments of his own touching the limits of the feeling of convergence, argues that the finest discriminations of distance rest on the feelings attending ocular movement. He found that the minimum change of distance of a vertical thread noticeable did not always correspond to one and the same displacement of the retinal images, but that it varied inversely as the absolute distance. In other words, the nearer the thread to the eyes, the greater the least change of distance perceptible.* Wundt would account for the agreement between the discriminative sensibility of the two retinas under the most favourable circumstances (*viz.*, with the least possible degree of convergence) and that of a single retina, by saying that in the finest monocular discrimination of adjacent points the feelings of movement exert an influence. On the point here at issue between the two eminent observers, something more will have to be said later on.

Let us now pass to the perception of absolute distance. This is found to be far less delicate than that of relative distance. According to Helmholtz "it is one of these elements of judgment which are easily overridden by others which contradict them". Many curious illustrations of the comparative bluntness of this feeling are given by Helmholtz. To these the reader must be referred. One fact respecting the nature of this judgment of distance by the feeling of convergence deserves to be reproduced. If we look at distant objects through two prisms of an angle of refraction of four degrees with their angles turned outwards, we see with *diverging* axes; and yet the objects though appearing a little further than when seen with the naked eyes, do not on the whole look very different. This fact is paralleled by another, namely, that stereoscopic pictures may be combined in a perception of a single object even when the axes are made to diverge. These facts appear to show that what we attend to in judging of absolute distance is the direction and amount of combined movement (convergent or divergent) from a position of average convergence.†

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* Wundt finds that this ratio (about 1 : 50) corresponds approximately with the ratio of the least perceptible differences in linear magnitude, or distance in two dimensions (*vide supra*). He argues from this that the basis of judgment in both cases is the feeling of innervation. Helmholtz suggests that this relation between absolute distance and least change of distance perceptible, may be explained (consistently with his supposition that the judgment is based on the discriminative sensibility of the two retinas) by saying that when the degree of convergence increases it becomes more difficult to keep the eyes fixed on a point, and consequently to estimate a displacement of the retinal pictures.

† Another curious point connected with the binocular judgment of distance is the error to which we are liable in estimating vertical lines

We may now pass to what seems to be the most complicated department in binocular visual perception, namely the conditions of double and single vision. The reader may be supposed to be aware of the familiar phenomena of double images which are sometimes seen when the axes of the two eyes converge to a point nearer or further off than the object which is seen double. He is also no doubt aware that the fact of seeing objects single with two eyes has given rise to a curious amount of psychological speculation. Recent observations have done much to define the precise conditions of this single vision, and a careful study of the experiments made will help us to answer the question why objects are seen single, and also to understand more clearly how we reach our visual perceptions of space.

Helmholtz has carefully determined according to the latest researches the limits of this coalescence of images, as it is called, in a single perception. Objects, he tells us, are seen double when they have in the two fields a position relatively to the point of fixation sufficiently dissimilar to be noticed by the eye by help of its measure of distance. We have then to ask what points in the two fields have an apparently similar position relatively to the point of fixation, or what points may be said to cover one another in the common field of the two eyes. These points are called 'corresponding points' or 'covering points'. We may of course equally well speak of corresponding points in the two retinas, meaning those which answer to these objectively projected points in the two partial fields. They include first of all the points of fixation themselves. At the same time the two centres of the retinal yellow spots are not always corresponding points. This is proved by the case of squinters whose retinal points of fixation do not correspond with the centres of the yellow spots. Again the retinal horizons, that is, the meridians which co-incide with the plane of vision in the primary position of the eyes, correspond. The other corresponding points are determined by these, namely, the retinal points of fixation and the retinal horizons. Thus the retinal meridians which

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under different circumstances. Hering and Helmholtz find that an actually vertical thread is perceived to be such with great accuracy if the eyes are in their primary position and the thread falls exactly in the median plane passing midway between the two eyes. If, however, the head is a little raised or depressed so that the plane of vision (that is the plane which contains the axes of vision) is no longer in its primary position, a thread which is to appear vertical must really incline towards the observer either at its upper or under extremity. Helmholtz explains this by help of the consideration already dwelt on, that with converging axes the direction and situation of objects are so judged as if the eye had a direction parallel to the mean direction of the axes, and the corresponding amount of rotation.

correspond to the apparently vertical direction of lines * cover one another. Again those points in the apparently vertical meridians which correspond must be equi-distant from the retinal horizons, and points in these last which correspond must be equi-distant from the point of fixation.†

Helmholtz reasons that the position of these corresponding points is determined by the frequency of the co-existence of impressions from one and the same object-point. Thus, as we have seen, the points of perfect vision only correspond in the case of normal eyes when they are also points of fixation. So again the distinguished position of the retinal horizons as corresponding regions is due to the same principle. The meridians which coincide with the plane of vision in any given position of the eyes are the only ones which will always receive a series of images of the same object-points quite irrespectively of the form and situation of the object. Also it is manifest that the retinal horizons are, of all the meridians which ever coincide with the plane of vision, those which will most frequently receive impressions from one and the same objective line, on the supposition that the primary position is the usual one.

Next to determining what are corresponding points in the two retinas and their projections, comes the task of determining what are corresponding points in objective space. That is to say, we have to find out what points of real objective space project their images on corresponding retinal points and consequently are (as a rule) seen single. This will, of course, vary with different positions of the eyes, and the directions of the optical axes. That portion of space which includes all such

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* These meridians are called by Helmholtz apparently vertical to the retinal horizons. The meaning of their deviation from strict verticality will be spoken of presently.

† These corresponding retinal points of Helmholtz are of course fixed, and the same for all the positions of the eyes. As will be seen presently their impressions do not in every case coalesce in a single perception. Wundt tries to meet these facts by introducing a different terminology. He calls (1) ‘identical points’ those which receive the same images from an object infinitely distant (the eyes’ axes being parallel). From these he distinguishes (2) ‘corresponding points’ *viz.*, those points of which the impressions most frequently coalesce in a single sensation. The first is an anatomical conception, the second a physiological. Finally he marks off (3) ‘covering points’ *(Deckpunkte)* of which the impressions are referred to a single object in any given case. Class (2) vary slightly with different individuals, whereas class (1) are constant for all. Both (1) and (2) are the same in the same individual for all positions of the eyes, whereas (3) vary with the position. Class (2) often coincide with class (3) but not always. These distinctions are no doubt valuable in understanding the phenomena of double and single vision. Yet I have thought it best in this case to follow Helmholtz’s simpler method of description.

points is known as the 'horopter'. The precise determination of the horopter is a difficult mathematical problem which does not specially concern us here.

One fact, however, must be mentioned. If the eyes are fixed on a point infinitely distant in the median plane, it is found that in the lower regions of the field the horopter is not a curve as in the upper regions but coincides approximately with the plane of our feet—that is, the plane of the ground on which we stand. Helmholtz ingeniously argues that this fact serves to account for the well-known fact that a line exactly vertical appears to the single eye slightly oblique. In other words, the meridian of the retina corresponding to the perception of the vertical is not exactly vertical. Helmholtz supposes that when we use two eyes and look at the distant field we are wont to attend (in indirect vision) much more to the many forms lying below the horizon in the plane of the ground than the few lying above in the sky. Hence we acquire the habit "of localising alike the images of these retinal points on which as we walk the same points of the ground are wont to be imaged". In other words, a line drawn on the ground in the median plane of our body comes to be seen as single though its retinal images are not parallel but converge upwards. Now this inclination of the images of our imaginary line is found to be the same, both in direction and in magnitude, as the inclination of the retinal image which answers to an apparently vertical line as seen by the single eye. The facts prove that the monocular perception of direction has been developed out of binocular experience. The norm for the vertical direction to the single eye is supplied by the receding line in the plane of the ground as seen by the two eyes.*

After thus determining what dimensions are viewed as the same in the two fields, Helmholtz proceeds to investigate the delicacy of this comparison of the fields. This, he tells us, is very nice so far as it enters into the judgment of solidity, though it is comparatively inexact in relation to the recognition of double images and the comparison of their positions in the two fields. With respect to the discrimination of the images of the fields which serves as a basis for the perception of solidity, the eyes' judgment is found to be most exact in relation to objects lying in the horopter, and becomes less and less exact as the distance from this increases. Thus the perception of relief is particularly exact in the plane of the ground. This may be seen by comparing the exact stereoscopic impression given by this plane under ordinary circumstances with the impression made by looking at the horizon with head bent sidewards or, still better, with head bent down so that objects are looked at between the legs.* In these cases, as Helmholtz points out, we see "the farther portions of the ground no longer as horizontal but as a wall painted on the surface of the sky."† The element of solidity and relief being much better appreciated in the case of objects lying in the horopter, we are accustomed instinctively to bring objects which we have to observe carefully, as far as possible, into the horopter.

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* Wundt thinks that this obliquity of the apparently vertical meridians is to be explained immediately by means of certain innate peculiarities of the muscular apparatus. This is more especially disposed for vision in an inclined and converging position of the axes. In consequence of this the sinking of the eyes is involuntarily attended with a convergent movement, and the raising of them with a divergent movement. This happens if we try to move our eye in a vertical direction upwards or downwards. Accordingly this really oblique movement is regarded as that which corresponds to a vertical direction in the field of vision. At the same time Wundt adopts the idea of Helmholtz respecting the influence of binocular vision on the single eye's perception of the vertical, and supposes that the mechanism of the ocular muscles has in this case adjusted itself to the needs of normal, that is, binocular vision.

Let us now pass to the second mode of comparing the two fields, *viz.*, that which subserves the perception of the apparent distribution of objects in the common field of vision, and the discrimination of double images. This is found to be exact only in the middle of the field, being liable to be very inexact in the peripheral regions. The conscious separation of double images is rendered impossible by a number of psychical conditions, foremost among which is a pre-existing conception of the unity of the object which projects the images. Certain precautions have to be taken in most cases in order to recognise double images at all, and even then the comparative estimation of spacial magnitudes by this means is much less exact than that of similar magnitudes in a single field.

The reader must be referred to Helmholtz's work itself for a full account of the circumstances which affect and limit this power of recognising double images, or in other words the conditions which determine whether the two images are fused in a single perception or recognised as double. The experiments in combining stereoscopically pairs of drawings, which are here described, are exceedingly interesting, and can easily be carried out by every reader for himself even without the aid of a stereoscopic apparatus. Here it must suffice to name one or two of the most interesting facts.

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* It is well to mount a stone or hillock so that the altitude of the head above the plane be not materially altered.

† Helmholtz refers the increased brilliance of the colours of a landscape when looked at in this way to the change effected in the perception of relief. So long as this is not disturbed the modifications of the colours of objects by the atmosphere are looked at as the customary attributes of distance, and not attended to in themselves.

The main ground for the coalescence of images which do not fall on corresponding points is their degree of resemblance to the two perspective images projected on the retinas by one and the same object. The greater this is, the more difficult it is to perceive them as two. Double images may often be recognised by means of a strenuous volition aided by a vivid representation of their plurality. Again the recognition of double images as such may be facilitated by the addition of most insignificant incongruities to the two pictures or designs which are to be combined. Once more it is shown by a series of experiments undertaken by Volkmann that images only coalesce when their vertical distance is small. On the other hand the limit of horizontal distance is much greater. It is hardly necessary to add that practice greatly improves the power of distinguishing double images.

Among the most striking facts brought to light in these investigations is that mentioned by Wheatstone, *viz.*, that just as the images of disparate or non-corresponding points may coalesce, so under certain circumstances the images of corresponding points may be projected in different directions and so seen double. This fact has been disputed, but Helmholtz shows that it is a necessary consequence of the coalescence of images of disparate points.

It may be asked whether movement of the eyes is essential to the coalescence of images and to stereoscopic perception. Brücke broaches the theory that all perceptions of depth are gained by movement, and that double images are only got rid of by successively fixating the single points and so seeing them simply. Yet it has been found by Dove that this combination takes place in many instances instantaneously when the pictures are illumined by an electric spark.* At the same time Helmholtz holds that with the wandering of the eyes over the object the intuition of depth or solidity becomes decidedly more exact and vivid than with the fixation of a point. This he explains by saying that we only perceive difference of depth or distance very nicely when the points happen to fall in the particular horopter of the moment.

In the foregoing investigations the double images resembled the perspective images which are usually received from one and the same object, and in consequence were easily combined as signs of this object. When, however, they are altogether different, having no such perspective relation to one another, this combination becomes impossible. When, for example, the two fields are filled with quite dissimilar forms, there is no question of combining the impressions in a single perception. Here it is simply a question of seeing the two fields, or one rather than the other. This subject has been studied under the title of "Rivalry of the fields of vision". It concerns us here only so far as it helps to throw light on the nature of the correspondence of the two retinas as exhibited in the binocular perception of space.

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* That ocular movement is not essential is proved also, as Helmholtz tells us, by the fact that after-images or spectra may be combined stereoscopically.

In general both images are seen simultaneously and superposed in the field of vision. Yet in certain regions of the field there dominates now the one image now the other. Through an effort of attention either image may be made to extinguish the other. Yet the attention cannot long be kept fixed on either image without the other intruding itself. More especially the image forces itself into consciousness when it has a prominent and striking contour. It is a point in dispute whether two fields differently coloured ever yield a single composite sensation of colour (*e.g.*, whether a blue and a red field yield the sensation of purple). Helmholtz and some others deny that this is the case, though there are not wanting good authorities on the other side. The perception of lustre which, as Dove has shown, may arise from the stereoscopic combination of impressions of unequal light-intensity, as white and black, is an interesting instance of the coalescence of the impressions of corresponding points. Finally it is found that the colour-impression of one retina may be intensified by contrast with a simultaneous impression of the complementary tint in the other retina.

We may roughly gather up the results of these investigations into the nature of binocular vision as follows: (1) There are no points of the two retinas whose impressions are always and under all conditions indistinguishable. (2) In the normal and mature organ there are certain corresponding points or circles in the two retinas of which the impressions tend with more or less force, varying according to certain psychical conditions of the moment, to coalesce in single perceptions. How these facts have been variously interpreted, I shall try to show in another paper. The real meaning of the correspondence between the two eyes is a *vexata quæstio* in the discussions of visual space. It is allowed by all that experience has something to do with the determination of the limits of single vision; but the point is sharply disputed whether this correspondence does not involve as well some connate anatomical connection which serves as a physical basis for a sort of *à priori* disposition to see single objects in a single space.

JAMES SULLY.

II.—THE PHYSICAL BASIS OF MIND.

UNDER this title Mr. Lewes, in his new volume,* passes from the general part of his philosophical task to deal with the more special 'Problems of Life and Mind,' and delivers himself on various questions that have lately engrossed much attention. Prominent among these is the question of so-called Animal Automatism, and it is proposed in the following pages to offer some remarks on the subject after considering his handling of it; but first it is necessary, as well as due to Mr. Lewes, to take account of other parts of the volume, which contain the results of long protracted inquiry.

In this country at least, Mr. Lewes holds an almost unique position. He is a philosophical thinker and psychological inquirer who is also a practical worker in physiology; or he is a physiologist whose positive investigations of the innermost phenomena of organic life are guided by trained psychological insight and an ever-present regard to philosophical principles. In either aspect of it, his activity is of prime interest to all who at this present time are concerned about the problems of Life and Mind. Physiological specialists, who naturally are every day more and more encroaching on the psychological domain, may draw much enlightenment from one who knows how to speak their language as well as the other; and psychologists, who have to endure many a sneer for their readiness to eke out subjective observation with second-hand objective discoveries, may repose special confidence in a fellow-inquirer who accepts no physiological results that he does not himself verify. Those parts, therefore, of his present volume where he appears most distinctly in his double character of physiologist and psychologist, or prepares the way for assuming it, have the strongest claim on our attention here. A short preliminary survey of the volume will make plain what they are.

We have first a series of discussions on 'The Nature of Life'. Since it is animal organisms that manifest mind, a clear view of the distinctive character of vital organisation is naturally the primary requisite for understanding that special form of life which mind is. Towards the general argument of his volume, Mr. Lewes here more especially contends that no mechanical expression can ever adequately represent the processes of life; he also impresses, for use later on, the very important distinction between Property and Function which he had the credit, nearly twenty years ago, of first bringing clearly into view in the physiological science of the present generation. The consideration of vital phenomena is then brought to a close in a long chapter on Evolution, which aims at showing that a struggle for existence is maintained not only among organisms but also among their component tissues and organs, and that the unity of type in organisms is rather to be explained by all-pervading laws of Organic Affinity than by Mr. Darwin's supposition of Unity of Descent. The next section is concerned with 'The Nervous Mechanism,' and contains much destructive criticism of current scientific doctrines, followed up by an exposition of such general notions of the structure and action of the nervous system as the author believes can be affirmed in the present imperfect state of knowledge. Then follows under the heading of 'Animal Automatism,' a somewhat varied collection of dissertations—historical, abstract, polemical—directed to the assertion of "the biological point of view" against a purely mechanical one in treating of mind as related to the living organism. And last, within the present volume, 'The Reflex Theory,' which forms so great a part of the prevalent doctrine of neuro-physiology, is subjected to an elaborate consideration from the same "biological" point of view, taken as it had already been by the author in regard to this particular question when he wrote his well-known popular work *The Physiology of Common Life.*

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* *The Physical Basis of Mind*, with illustrations. Being the Second Series of *Problems of Life and Mind*, by GEORGE HENRY LEWES. London: Trübner & Co., 1877. (Vol. I. of the First Series, *The Foundations of a Creed*, appeared in 1874, and Vol. II. in 1875.)

The last two "problems," while intimately connected, arise naturally out of the "problem" of the Nervous Mechanism as treated by Mr. Lewes, and must be approached through it. On the other hand, the preliminary discussion on the Nature of Life, if its general import is kept in view later on, need not here detain us. Not the least interesting portion, it may only be remarked in passing, is that in which Mr. Lewes seeks to generalise the principle of Natural Selection by extending it to the organised elements of composite animal organisations; as he had already some years ago proposed to amend Mr. Darwin's theory in another direction, namely, by supposing Natural Selection to proceed upon an indefinite number of original protoplasts emerging under similar conditions, instead of the four or five or even one considered by Mr. Darwin himself at once necessary and sufficient to account for all the variety of related organic forms. Mr. Darwin, in reply to the earlier criticism, has admitted (*Origin of Species*, 6th ed., p. 425) the possibility that at the first commencement of life many different forms were evolved, but thinks it may be concluded that in that case only a very few have left modified descendants. One would gladly learn his opinion of the extension now proposed of his famous theory. Perhaps it may be guessed that he would decline to load the theory with an application so purely speculative, and not unreasonably, considering the difficulty of its verification even within the original limits. It cannot, however, be denied, in view of what is already known of the composition of organisms from living elements, that the question of the origin of species is but one aspect of the general question as to the development of life, and Mr. Lewes does good philosophical work when he raises it in its full implication.

As regards the Nervous Mechanism, Mr. Lewes has long been known to hold unfashionable opinions, which now at last receive a formal expression. He confines himself for the present, indeed, to the more general aspects of the nervous system, reserving the question of the functions of the brain till the physiological exposition can be accompanied by the necessary survey of psychological processes; but, as it stands, his treatment is fraught with observations of deep import to the psychologist. Mr. Lewes is persuaded that a great part of the current doctrine, confidently propounded by anatomists and physiologists and implicitly received by too confiding psychological inquirers, is either wholly baseless or at least not yet based on actual experience. An imaginary anatomy makes fibres run into cells and cells prolong themselves as fibres in a way that no eye has ever seen, all because of a physiological prepossession as to the part played by these particular elements in the nervous system. It is by an over-simplification of the system that these elements are singled out from the whole mass of it, and the proper scientific task of analysis is again overdone when division is arbitrarily made of the system into sides and parts, which are credited with such diverse characters in separation that it becomes impossible to understand how they should form together a system the most coherent and uniform that is. It is difficult not to allow the force of Mr. Lewes's objections against many of the most fundamental positions in the reigning doctrine of neuro-physiology, and the vigour of his criticism, informed as it is by the practice of original experimental work, bespeaks attention to the doctrine (given in outline) which he would substitute, at least provisionally, for the too definite teaching of the schools. Some of his more characteristic views, not now expressed for the first time, have indeed already begun to modify the traditional dogma in the minds of younger physiologists.

The key-note of his doctrine is the assertion of uniformity of structural plan and mode of working in all parts of the nervous system, high and low. This is not denied or is even affirmed, in so many words, by physiologists in general, but they are apt to couple any such assertion with others which to Mr. Lewes seem to rob it of all its significance—as, for instance, that the action of the lower centres is purely reflex or mechanical; that the action of the higher centres differs in being conscious action; that particular nerve-calls are sensory or motor, or even sensational, or ideational, or emotional; and the like. Not that he either pretends that there is no distinction in the action of the different parts: there is undoubtedly the most marked difference of function or *use*, according as the various collections of nervous elements, distinguished as particular nerves or centres, are connected with different structures in the bodily organism. But this circumstance only makes it the more vitally important, for the comprehension of the system generally, to signalise the fundamental identity of character pervading all its parts, and this Mr. Lewes does by distinguishing (after Bichat) Property from Function, and maintaining that the elements of the system in all their variety, both as elements and when aggregated, manifest everywhere one perfectly characteristic property. This property he speaks of under the two names of "Neurility" and "Sensibility," according as it is presented by the nervous lines branching out towards the periphery or by the parts distinguished as central; but, however named, we are to think of a purely objective quality, symbolising a multitude of changes expressible ultimately only in terms of motion. Thus understood, the conception undoubtedly helps to a clear understanding of the whole system of neural processes, which is otherwise apt to be misconceived from the fact that our conscious mental life is obviously related to some of the processes rather than to others, or to some more than to others. There is, besides, positive evidence that native property survives functional appropriation in the well-known facts, established by Vulpian and others, of function becoming experimentally reversed; and Mr. Lewes would even suggest in one place (p. 282) that the same fibres which carry impulse out to the muscles may transmit the muscular reaction as a recurrent stimulus inwards to the centres—a view which, if it could be maintained, would help to reconcile the notoriously opposite interpretations of the muscular sense now prevalent. He also gives due prominence to all the facts tending to show that nerve-fibres are not merely passive carriers, and that the grey matter (for example, in the spinal cord) performs the work of transmission as well as any fibres.

Next to the fundamental uniformity of plan and process throughout the nervous system, it is the actual coherence and solidarity of its parts with unity of action that Mr. Lewes is most concerned to establish against the exaggerated "analysis" of the common physiological view. He objects to the distinction of peripheral and central parts as artificial, protests against the opposition of sensation and motion if taken to imply the independent and unrelated working of two sides in the nervous system, and seeks above all to bring into relief the diffuse character which nervous disturbance is prone to assume with the effect of implicating the whole organism. He does not, of course, overlook the salient feature of the nervous system known as "isolated conduction," or forget how mental growth through experience depends upon restriction of the original "irradiation"; but he is utterly sceptical as to the efficiency of the medullary sheath which is commonly assigned as the means of insulating the ultimate nerve-lines, while refusing, in the present state of knowledge or ignorance, to hazard any other explanation of the fact in as far as it occurs. That it must not be asserted in any absolute sense, so as to imply fixity or invariability of nervous conduction, he is quite sure: "fluctuation," he is never tired of repeating, is the characteristic at least of central combinations, and this, he more than suggests, may be dependent on the presence of a structural element for which no allowance has been made in the current physiological theories, namely, the so-called Neuroglia. According to some a kind of merely connective tissue, affording mechanical support to the true (fibrous and cellular) elements of the nervous system while itself not neural, this "nerve-cement" seems to Mr. Lewes, whether called neural or not, to play an essential part in all the processes of the system and probably a more important part than even the nerve-cells (p. 246).* In any case, until the network of the Neuroglia is better understood and duly taken into account, there can, he maintains, be no thought of having a theory of the working of the nervous system satisfactorily based, as it should be, on the ground of elementary anatomy. Meanwhile Psychology, in the way of objective help, must be content with such general knowledge as anatomy already affords of continuity and coherence in the nervous system, and for a notion of the physical conditions of mental life must rely rather upon the researches of physiologists and pathologists.

The general representation of the working of the nervous mechanism which Mr. Lewes accordingly proceeds to give at the end of this part of his inquiry, strikes one as marked by a happy mixture of boldness and circumspection. It is, of course, only provisional as well as general, but the way in which he manages, by a comparatively simple theory, to order the chief facts and to suggest consistent explanations of special difficulties, deserves warm acknowledgement. Without following him into his formal expression of laws, some notion may here be given of his view of nervous action by quoting a passage that brings its main points into relief through an apt and instructive simile:—

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* Wundt (*Physiol. Psychologie*, p. 29), after a short anatomical description of the Neuroglia in his text, disposes of it physiologically in a foot-note. He mentions that the body of it, while enclosing cells that are clearly not nervous, has itself a constitution somewhat resembling the protoplasmic contents of ganglionic cells, and that many observers (Wagner, Henle, &c.) have thereby been induced to consider it as nervous in character. But this view, he declares, is wholly at variance with all that is known of the relations subsisting between the fundamental nerve-elements, *viz.*, the ganglionic cells and nerve-fibres.

> "Imagine all the nerve-centres to be a connected group of bells varying in size. Every agitation of the connecting wire will more or less agitate all the bells; but since some are heavier than others and some of the cranks less movable, there will be many vibrations of the wire which will cause some bells to sound, others simply to oscillate without sounding, and others not sensibly to oscillate. Even some of the lighter bells will not ring if any external pressure arrests them; or if they are already ringing, the added impulse, not being rhythmically timed, will arrest the ringing. So the stimulus of a sensory nerve agitates its centre, and through it the whole system; usually the stimulation is mainly reflected on the group of muscles innervated from that centre because this is the readiest path of discharge; but it sometimes does not mainly discharge along this path, the line of least resistance lying in another direction; and the discharge never takes place without also irradiating upwards and downwards through the central tissue. Thus irradiated, it falls into the general stream of neural processes; and according to the state in which the various centres are at the moment it modifies their activity" (p. 284).

A notable feature in this view is the treatment of Arrest as but another aspect of Discharge, whereby he gets rid of the complex machinery of inhibitory centres which has become so troublesome in recent physiological theory; but instead of dwelling on this or any other of the interesting questions raised by Mr. Lewes, it must suffice to direct the attention of psychological students to the whole of this closing chapter on the Laws of Nervous Activity, and we may now pass to the third and fourth "problems". Thus far Mr. Lewes has been treating the nervous system from the anatomical and physiological point of view. Only in the chapter where he introduces his use of the word Sensibility to mark the common property of nerve-centres (as opposed to the common property of peripheral nerves, which he calls Neurility) is he led to refer to the subjective aspect of nerve-processes which, he does not deny, is unavoidably suggested by the word. In spite of the ambiguity he deliberately makes choice of it to designate the objective quality he has in view, and he believes he has his reward in evading, with it and its companion-term Neurility, the more seriously confusing associations of the alternative name Nerve-force. For the subjective aspect of Sensibility he proposes, or rather at once claims as a matter of course, to use the word "Sentience;" and, though in the chapter itself he somewhat curiously interchanges the words as if they meant not only the same thing in different aspects (which he afterwards seeks to prove) but quite the same (subjective) aspect of the thing, yet, on the question of principle, he is most impressive in his distinction of the two aspects, and, while indicating as clearly as possible the respective tasks of physiologist and psychologist in the matter, he confines himself in all the remaining chapters of his second part strictly to the objective view. In the last two parts of the volume, on the other hand, it is the subjective phase of mind that is uppermost—not indeed as viewed in itself by the introspective psychologist but (in accordance with his main title) as that of which the nervous mechanism is the "physical basis". The amount of controversial matter in these two parts makes it somewhat difficult to take an orderly critical survey of his positions. On the whole it seems best to work into his meaning through the discussion of the Reflex Theory which he himself takes last, keeping in view, where necessary, the more general considerations ranged under the head of Animal Automatism.

What is the precise import of the Reflex Theory as understood by physiologists, who do not as a rule trouble themselves much about the full psychological implication of their statements,—may be a matter of question; but Mr. Lewes takes pains to leave us in no doubt as to the counter-theory which he, with his face distinctly set towards psychology, would substitute for it. While the current theory seems to him to assert dogmatically that the nervous processes in lower centres may and do pass as purely physical (or, as they are called, mechanical) changes without having any psychical aspect whatever, he contends that every central nervous process, to the very lowest and simplest, in any organism, intact or truncated, that is not dead, has in and for itself its proper psychical phase or aspect, as much as the highest and most complex cerebral process accompanying or accompanied by that which all understand as a conscious experience. He does not say that the psychical state concomitant with the action of a lower centre is a conscious state—either that the centre is itself endowed with consciousness or that the man or animal is conscious in the case; as indeed, for that matter, he denies that the centres immediately concerned in the higher cerebral process are in themselves the seat of consciousness, or that the man or animal need always be conscious in *this* case. But he does assert that in the one case as well as the other there is, besides the physical, a real psychical occurrence which is to be understood in terms of "Feeling" or subjective experience. He commits himself, for example, to the general statement that "Feeling is necessary for reflex action" (p. 435), meaning this at all events, that whenever and wherever a central nervous process goes forward in a living organism there always is present something that may be called Feeling. His favourite expression, however, is that the centre has Sensibility; and, though he may have wished elsewhere to understand by Sensibility a purely physical or objective process—something wholly expressible in terms of matter and motion—here, there can be no doubt, he means by Sensibility a subjective condition as well. This is abundantly clear when, in the course of his argument, he claims for every active centre a power of Discrimination, Memory, &c.; or if it be said, as is sometimes half implied (p. 463), that these terms may after all be understood objectively—*e.g.*, Discrimination as meaning only "neural grouping"—*cadit quaestio.* No upholder of the Reflex Theory, even in Mr. Lewes's statement of it, denies that the centres perform a work of neural grouping, or that, as a plain matter of objective fact, there does appear an "adaptation of the mechanism to varying impulses".

The theory he opposes has, according to Mr. Lewes, nothing to rest on but a mere prejudice as to the brain alone being the seat of sensation. When the actual facts observable in animals (with or without brains) are fairly weighed, especially in the light of what is known of the structure and laws of the nervous system, the theory must give way to a truer representation of the behaviour of the living organism. Presumption against presumption, it is quite the opposite view that is suggested by way of general deduction before looking at the particular evidence. The nervous system, as we saw, has a uniformity of structure and working everywhere, and is also in the truest sense a coherent whole. In as far as it is possible at all to speak of separate action of its parts (this or that centre) in their natural state of union, the processes in all of them appear exactly similar; and, in fact, a process set up anywhere may always implicate the whole system, and through this the organism generally. A reaction of the general organism being the natural outcome of every stimulus, the particular reaction that is at the moment possible for each, amid the multitude of impressions always being received, will determine the character it assumes subjectively. The same kind of impression that at one time appears as a conscious state specially attended to or distinctly felt, may at another time in the crush of impressions not come into consciousness at all; but in being thus unconscious, it does not cease to *be* subjectively—it does not lapse out of the domain of Feeling, for at any moment it may again acquire the character of a conscious sensation, if the brain is not otherwise engrossed. So, if the brain is removed altogether without loss of life, we are not to suppose that such reaction as is still possible in the organism has no longer any psychical character, merely because it can no longer appear as it did to the animal that was conscious through the brain. Indeed, if we turn to the actual facts, "instead of marvelling at the disappearance of so many modes of sensibility when the brain is removed, our surprise should rather be to find so many evidences of sensibility after so profound a mutilation of the organism" (p. 439). The facts warrant, according to Mr. Lewes,—especially those placed under the head of Instinct (pp. 463, ff.)—precisely the same *kind* of inference as is forced upon an observer by the deportment of animals in their intact state. With Pflüger, he urges that it is only by inference from objective signs that we ascribe subjective life to any other man or animal, and where the signs, though in the absence of the brain, remain precisely what they were, the inference is not to be evaded.

There is no need to follow Mr. Lewes into his interpretation of the facts, as far as he adduces them, in detail. The point of real significance is to understand the general reason why Sensibility in its full meaning—not as mere "neural grouping"—should be so expressly claimed for the spinal cord. Or it may be said that everything depends on the use to be made of the concession, supposing it were not withheld; for if it is true that the claim can never be proved, it is equally true that it admits of no positive disproof. First, however, we must seek out the true meaning of the Reflex Theory, to see what is the real difference that separates Mr. Lewes and its upholders.

The Reflex Theory, though often enunciated in an incautious or in a half-hearted way, is at bottom nothing but an assertion that, wherever there is nervous stimulation followed by nervous outcome (appearing as movement or otherwise), there is a continuous physical process through the central parts involved, and no hyperphysical or metaphysical agency is to be assumed there for the explanation of the forthcoming result. When first formulated, the statement was confined to the lower centres, but this may have been rather because the processes in these were simple and could be approximately traced than because the cerebral processes were believed to be disparate in kind, that is to say, physically discontinuous, by reason of the intervention of a non-physical agent (the conscious ego) at the higher centres. Or, if indeed some, nay many, assertors of the Reflex Theory have limited it to the spinal column and more immediately connected parts, under some such notion (more or less vaguely expressed) of a difference of conditions in the brain, this is a weakness or misunderstanding which clearer heads have been able to surmount with the gradual advance of physiological knowledge. The doctrine of Animal Automatism, as Mr. Lewes himself remarks (p. 389), is only the Reflex Theory legitimately carried out; at least, it includes the assertion that all central nervous processes whatever, high as well as low, are physically continuous—that the "nervous arc" is unbroken in the brain just as in the cord. When, therefore, Mr. Lewes urges elsewhere (p. 453), as one objection against the Reflex Theory, that there are cerebral reflexes as well as spinal reflexes, he urges that which consistent supporters of it are themselves most forward to maintain. He does not differ from them seriously even when he would urge that, as cerebral processes in another aspect of them are mental processes, so some kind of mental process may always be assumed as the obverse aspect of a spinal reflex: they do not assert this, but neither do they deny it as a matter of fact in what they do assert. He differs from them radically only if he maintains that Reflex Action is made what it is through the agency of Feeling—that "Feeling is necessary for Reflex Action" in the sense that without the presence or interposition of feeling reflex action cannot be conceived as proceeding.

Now it is impossible to doubt that this or something very like it is Mr. Lewes's meaning, and that he evidently thinks he thereby makes a distinct advance towards a scientific comprehension of Mind. This is the object he has in view throughout his whole argument, and not the gratification of any mere fancy for harmonious philosophical expression. Others have indulged in speculation as to an unconscious mental life bound up with the action of the spinal cord, and, not stopping there, have interpreted in an analogous manner the vital processes in plants and completed their philosophical sweep by supposing every change or motion in the physical world to be in some shadowy fashion the direct manifestation of a mind or mental principle. Mr. Lewes does not go so far a-field. He founds no argument on the so-called sensitiveness of plants, to say nothing of simpler physical processes; he does not assert that wherever the property of Neurility is manifested, as in detached portions of nerve, there we must also assume the presence of some sort of subjective feeling; nay, even when there is distinct "neural grouping," and thus evidence of the *objective* property of Sensibility, as when the cheek of a guillotined victim responds with blushing to a stroke, he scouts the notion of the blow being felt (p. 439). But wherever there is an animal organism, either living as it naturally lives or, however mutilated, able to retain life, all its central actions, he maintains, are what they are —actions of a living thing and not motions of a dead mechanism —only by virtue of Feeling, and if not first viewed as felt they are wholly unintelligible.

What, then, is the precise difference between a Living Organism—at least an animal organism with a nervous system—and a mere Mechanism or Machine, which renders it necessary to assume feeling as the ground of all action in the former ? This is a critical question which Mr. Lewes raises over and over again within his volume, and strives to answer in the most determinate way. His answer always turns more or less upon the point that an organism is peculiar in showing selective adaptation in all its acts, that is, varying combination of motor impulses to suit the varying requirements of the effect to be at any time produced, or, as he also puts it, fluctuating combination of elements in response to variations of stimuli. This, he holds, is found in no machine ; nor has a machine either that primary constitution, distinctive of organisms, which appears as their inherited specific nature, or a history, in the sense of having its primitive adjustments modifiable through development of structure brought to pass by the very fact of its working experience. Otherwise, in his many discussions of the subject, he urges that, however organisms may exhibit phenomena referable to physical and chemical agencies, they also exhibit others that can never be expressed in terms of these ; and, again, that the organism is no mere mechanism, because mechanics can assign only the abstract laws of its movements, and cannot account for its behaviour in the concrete.

The statements may pass for what they are worth ; but even if they were unexceptionable—which the last, for example, hardly is, since mechanics gives no more than the abstract laws of the motion of any body whatever—they yet fail to prove anything as to the efficacy of Feeling in organic processes. It is accordingly by another line of argument that Mr. Lewes really seeks to establish his general position. He does not so much build any conclusion on the shortcomings of the Reflex Theory, as reject this because he has already satisfied himself that where conscious feeling is allowed by all to be present, it determines the nervous processes to be what they are in the living organism. Here, then, we turn expressly to his view of the doctrine of Animal Automatism. An outgrowth (in its recent statement at least) from the Reflex Theory, it may perhaps be so overthrown as to uproot the Reflex Theory with it. Its central idea, now become familiar to all, is that consciousness, although present, does not count for anything in the vital history of man or animal—that all animal actions may be completely expressed and accounted for in terms of (nervous) matter and motion without the interposition of feeling as a factor at any point of the course and indeed without any reference whatever to conscious experience. Supposing this were true, there is obviously a very intelligible sense in which it can be said that everything proceeds mechanically in the living organism: not that there is no difference between a biological process and a simple physical movement, any more than there is no difference between a chemical reaction and the rebound of a ball, but in the sense that just as a chemical process can and must always be interpreted ultimately in terms of motion, so a nervous event must likewise in the end be so interpreted. Be this point of expression, however, as it may, Mr. Lewes is by no means disposed to grant the main position. He contests the ground inch by inch with Professor Huxley who some years ago gave an impressive exposition of the doctrine of Automatism, and, what is more, he enters upon a line of consideration which not only, as it seems to him, affords the deepest reason for asserting Feeling to be an agent in the vital procedure of man or animal, but also yields a strictly psychological solution of the general question of the relation between Body and Mind.

As a metaphysician, Mr. Lewes is a monist who declares that objective Motion and subjective Feeling are but two aspects of one and the same real, but he confesses that he did not always clearly see *how* a physical process could also be a psychical process. Even now, in a chapter (on Body and Mind) that is otherwise marked by great insight and subtlety of expression, there is some want of clearness or consistency in the explanation that is offered; but his general drift is unmistakeable and is to the effect that what we call Matter and Mind, Object and Subject, are symbols of different modes of feeling or sentience, which may both represent the same real, just as one tuning-fork may appear moving to the eye and sounding to the ear. The two differ merely in the mode of apprehension. Still they do differ, and nobody could more impressively urge than does Mr. Lewes in this chapter (see especially p. 342, as at the earlier stage before referred to, p. 193), that there must be no mixing-up of the different aspects—that when we are talking in terms of Matter and Motion, *i.e.*, "optico-tactical experiences accompanied by muscular experiences," we must not shift about and pass over into the phase of specially subjective experience for which the comprehensive symbol is Mind, nor *vice versâ*. Thus, if by positing only a difference of psychological aspects, not a difference of substances, he is not saddled with the metaphysical difficulties of Dualism, he also, by taking the different aspects as equally independent, avoids the error of those who are prone to sacrifice the subjective to the objective aspect, speaking of the terms of the physical series as the causes of the corresponding psychical terms in a sense which does not admit of being reversed—as if, that is to say, the one were always to be absolutely assumed, while the other may be considered or neglected at will. And yet he is perfectly aware of the special scientific advantage there is in seeking for an objective expression of the facts of subjective experience, which, though it never should be declared a mere accident of the series of physiological processes, does yet, as subjective, not admit of the same rigour of scientific statement.

This, then, is the argument, and so far it might seem intended for the rescue of Feeling from the subordinate position to which it has too often been improperly consigned, and the establishment of a thorough-going parallelism of the physical and psychical; but now we have to learn that Mr. Lewes's real meaning is very different. Because the objective series of nervous processes and the subjective series of corresponding mental states may both, in ultimate psychological analysis, be regarded as modes of feeling in some consciousness or other, this is to be a reason for declaring that Feeling—meaning always a mental state in the subjective series—may and does enter as a term into the objective series, which, as properly objective, consists of molecular movements in nerve. Let the reader, in particular, refer to p. 403 where, after his long combat with Prof. Huxley, Mr. Lewes proceeds to sum up his argument on the special question of so-called Automatism. There we are reminded once again that, though we may believe Consciousness, which is a purely subjective process, to be objectively a neural process, we are nevertheless passing out of the region of physiology when we speak of Feeling determining Action: motion may determine motion, but feeling can only determine feeling. Yet we do, says Mr. Lewes, speak of Feeling determining Action, and we "are justified: for thereby we implicitly declare what Psychology implicitly teaches, namely, that these two widely different aspects, objective and subjective, are but the two faces of one and the same reality. It is thus indifferent whether we say a sensation is a neural process or a mental process—a molecular change in the nervous system or a change in Feeling. It is either and it is both." Certainly, it is here made clear why Mr. Lewes has previously permitted himself to use the same word Sensibility to express the objective fact of neural grouping and also a fact of subjective experience; but with what reason he denounces those who, when they are speaking in terms of matter and motion, cannot keep to their text but will persist in dragging-in terms of subjective import—is not so clear. Why should they not use the subjective words? How do they go beyond the reckoning, when it is exactly the same thing they are speaking about in the one language or in the other? Or is Mr. Lewes's meaning this—that the physiologist indeed must keep, like any other physical inquirer, to the sphere of the objective in which he finds himself and which he cannot explain, but the psychologist is at liberty to pass at will between the subjective and the objective spheres because *he* knows and can prove them to be one in reality? If this be so, surely the psychologist's fate is hard. Alas for his insight if it must be the death of his science—if it shows him the same thing with two different sides to be named and will not suffer him to speak consistently about either!

Now let us note, before closing the account, two other positions taken by Mr. Lewes that are in different ways remarkable. One is where he declares at the end of his whole argument (p. 409), that "the question of Automatism may be summarily disposed of by a reference to the irresistible evidence each man carries in his own consciousness that his actions are frequently—even if not always—determined by feelings. He is quite certain that he is not an automaton and that his feelings are not simply collateral products of his actions, without the power of modifying or originating them." And Mr. Lewes adds, "this fundamental fact cannot be displaced by any theoretical explanation of its factors". One reads the words with a certain surprise. There may be reason indeed for protesting against such an incautious statement as that feelings are "products" of (nervous) actions: all that Mr. Lewes urges anywhere against attempting to explain the psychical series as dependent on the physical series, is much to the point. An Automatist who contends for pure parallelism of the physical and the mental, must no more think of breaking the mental line for the physical than the physical for the mental, nor has he a right to view the mental as a discontinuous efflux from the unbroken chain of nervous events. But the bare suggestion that any scientific deliverance on the subject can be based upon the immediate evidence of consciousness, is somewhat confounding when it comes from Mr. Lewes. The end of that kind of reference in questions of philosophy is but too well known. If it were allowed in this particular case, what becomes of the parallelism of aspects which nobody maintains more strongly or on deeper grounds than Mr. Lewes? He would break it in one direction as much as he charges Prof. Huxley with breaking it in the other. But, indeed, from the point of view of direct consciousness, what question is there of a parallelism at all? That a nervous process represents one purely phenomenal aspect of what, on another purely phenomenal aspect, is a conscious mental state, may be a very profound truth, but it never was ascertained on direct evidence of consciousness, which, in the sense in which it ever may be said to take account of nervous processes, views them as physical changes in a material structure supposed to exist apart. Nor, whatever reason or excuse there may be for the natural conviction we have as to a relation between feeling and bodily action, can this be allowed to affect one way or another the validity of the philosophical interpretation.

The other statement referred to occurs at an earlier part of the argument, but is here taken last because it gives occasion for the few remarks on the doctrine of so-called Automatism which will bring this article to a close. Can we translate all psychological phenomena into mechanical terms? asks Mr. Lewes at p. 352, and he replies (for reasons before mentioned) that we cannot—"nay, that we cannot even translate them all into physiological terms . . . nor can the laws of Mind be deduced from physiological processes, unless supplemented by and interpreted by psychical conditions individual and social." It is important to take account of this last remark (though it is not followed out at the place or anywhere adequately enforced throughout the discussion), because otherwise the denial of the possibility of expressing mental phenomena in physiological terms would stand in sharp contradiction with all that the author so often says about neural and mental processes. Plainly, he cannot mean that there is not an exact physiological expression (if it could be obtained) for every psychological phenomenon. He rather means (I can only suppose) that just in the sense in which a biological phenomenon is more than a chemical one, so a psychological phenomenon is more than a biological. And this is a most important consideration, which if fully grasped may lead us to see that the notion of Automatism fails to express just that which is most characteristic in the life of Mind. But for this a little explanation is necessary.

It was said above that there is a sense in which the expression of biological phenomena in purely objective terms of motion may be called a mechanical view of them. Does this mean that from the principles of mechanics it is possible to deduce the phenomena of life? Not at all. It only means that, as life is manifested by a material structure, no vital change, when it happens, can be interpreted otherwise than as some more or less complex phenomenon of motion. More immediately, in many cases, the vital change may have to be phrased as a chemical process, but this, it is not denied, is a peculiar mode of motion—some re-arrangement, let us say, of atoms in space; and mechanics (or general physics) contains the laws of all such change of position. Of course there is nothing absolute or final in such an expression of chemical and biological phenomena. Even supposing we could assign to the minutest particular all the motions or re-arrangements in space that constitute a chemical or a biological phenomenon—supposing, that is to say, we had found the complete physical or mechanical expression—it would still remain a problem to find the purely mathematical expression of this physical expression; and, again, the full mathematical expression, if it could be found, might be viewed as the result of a conceivable logical combination. But short of this last stage, at which the problem ceases to belong to objective science, it has come to be thought sufficient in modern times to find the mechanical expression for any material phenomenon, because motion admits of definite measurement; and hence the idea that such an expression constitutes an ideal explanation. However, just as the laws of motion cannot themselves be deduced from mathematical principles without data from experience, so, I repeat, there is no question of merging chemistry or biology in physics, in seeking for a mechanical interpretation of chemical and vital phenomena. Chemical processes must be investigated in the special conditions under which they appear in our experience—only always in the light of physical principles; vital processes likewise—only always in the light of physical and chemical principles. And so also mental phenomena, while studied in the light of biological principles and the others implied in these, have to be investigated in the special conditions that are found to determine them. They doubtless admit of translation into physiological terms, but physiology can never explain their rise.

Now the doctrine of Automatism declares that the state of the living organism, more particularly the nervous system, is at any moment the effect of its state immediately preceding and the cause of its state immediately succeeding; just as an automaton, or mechanism involving some internal principle of motion, goes through a series of operations each of which in turn brings on the next. As a matter of fact, the various nervous processes, as they are successively brought to pass, have or may have subjective concomitants, which are called, in the cases where they excite attention, states of conscious experience; but none of these have the least real influence in determining the next condition of the organism, or (as it should be, but is not always, clearly understood and expressed) are themselves determined by the accompanying or the foregoing organic states—at least in the sense in which these are causally related to one another. Though the presence of consciousness makes the man or animal a *conscious* automaton, all the vital acts that are commonly called mental are, it is said, truly those of an automaton inasmuch as they are physically predetermined and would come to pass equally though consciousness were wholly absent. The doctrine is thus something more than a mere extension of the Reflex Theory, as it was previously described. As the name Automatism suggests, the organism is supposed to have within itself a principle of action whereby the succession of nervous processes, both cerebral and spinal, is physically determined; and the direct implication is that the life of man or animal not only may be considered as a set of purely physical occurrences, but cannot otherwise be scientifically regarded.

Now, if this is at all a true representation of the theory of Animal Automatism, it is surely quite inadequate as an expression of the facts of mental life. The state of the brain or whole nervous system at any moment is always one factor in the causation of its succeeding state, but, at least in all cases where anything of the nature of a new mental experience or acquisition is involved, it is one factor only. If we consider how many and what kind of factors may co-operate in producing the physiological condition (of brain, &c.) which corresponds with that which we call (subjectively) a mental judgment—even a very simple one—we are obviously face to face with a phenomenon belonging to an altogether peculiar order of occurrence. Using the word in the first instance merely for discrimination, we have in the *mental* phenomenon something at the least as much more complex than a vital phenomenon as this is more complex than a chemical phenomenon. And whether or not there is any scientific advantage (perhaps there is not much) in likening the multiplicity of vital reactions to the reaction of an automaton, because both are motions determined largely from within,—in the case of mental phenomena, at all events, the comparison is unsatisfactory in every way. While the reference to any internal mechanical arrangement that may be devised gives, on the one hand, hardly the least notion of the marvellous organisation of the nervous system, slowly developed as this has been in and through actual working, it gives, on the other hand, an exaggerated notion of its independent activity as the organ of what is specially called Mind. For all its apparent spontaneity, the nervous system as the organ of mind works mainly in response to stimuli supplied by the natural and social environments. Even if nothing had to be said about a subjective representation of these, to overlook them as factors in the peculiar result which follows from them is to omit all that is most characteristic in the case.

But it may be said that it is no part of the doctrine to exclude reference to the external factors: what is really contended for is the right to express all the factors, internal or external, in physical terms, or rather the scientific necessity of so doing, and the right to discount all reference to conscious or subjective experience as irrelevant to the scientific issue, whatever other interest it may happen to possess. And truly, though the word Automatism is quite inappropriate as an expression for this conception, it is not for a moment to be denied that the mental life from first to last in all its phases—its potencies, its actuality, its very aspirations and ideals—admits conceivably of physical expression. But the grave mistake, nay the profound error, is to think of building the science of mind upon such a foundation—is to fancy that this way of looking at mind is the only scientific way or even, in the actual circumstances, at all truly scientific. Would it be right to defer the study of life till physics and chemistry with mathematics are sufficiently developed to furnish a deduction of it, or, if not wholly deferring the study, are inquirers bound to refrain from establishing any facts or laws which they cannot exactly express in terms of chemistry and physics? Physiologists, by their practice, answer emphatically No, and theoretically they might urge that the chance of ever finding the physico-chemical expression of vital phenomena (to say nothing of their fully reasoned construction) depends not least on the prior ascertainment of the phenomena as vital. With what reason, then, can the impression, or even (as it may be and is) the well-grounded conviction, that mind in all its phases has its physical equivalent, whereby it is brought within the realm of objective nature and may on this side conceivably be studied—with what reason can this conviction be urged against the study of subjective mind, or be made the ground of a serious assertion that consciousness is a mere accident of a certain determinate succession of physical events, when, but as they are subjectively represented, the factors whereon the events depend could not be discerned and brought within the view of scientific inquiry? A possible assertion it, no doubt, is, and there may even be some use in making it by the way, as a means of lending impressiveness to the affirmation of the never-failing physical aspect of the mental life. But it is no serious assertion to rest in with a view to science, for the reason just given. The conditions natural and social upon which mind and the corresponding series of organic states in point of fact depend, would never come into view at all except in the guise of properly conscious or psychological experience. Only, as we are first conscious of influences received from the world of nature and (through speech and otherwise) from our fellow-men, can we afterwards have any true idea of all the (physical) circumstances entering into the causation of that series of nervous positions which we may come to think of as co-existing with the flow of our subjective life. How then can this be truly described as accidental in the case? And let it be observed that here the argument is conducted strictly from the point of view of phenomenal science. We may leave out of sight that deeper philosophical consideration, according to which the series of complex physiological events itself appears in ultimate analysis as compacted of a special class of conscious experiences.

In my opinion, the Reflex Theory and the more developed Automatic Theory err not in what they really affirm but in what they are understood by many of their advocates to deny. When the Reflex Theory is supposed to mean that the nervous action of the spinal cord is in no way related to the life of subjective experience, it goes beyond the evidence, even although there can be no proof positive of the counter-assertion that every central nervous process is at the same time, in another point of view, a fact of mental experience conforming to psychological law. When the Automatic Theory is given out as meaning that conscious experience has no scientific import, it not only goes beyond the evidence but bars the way against the kind of psychological investigation that practically and theoretically can best be justified. The Reflex Theory brings into view a consideration of great scientific moment when it declares that, without the least reference to conscious or any kind of subjective experience, there is physical provision in the nervous system for the accomplishment of acts most deeply affecting the well-being of the organism. It only errs if it is understood to imply that there is no further question to be asked about such arrangements and that they cannot be at all viewed, either in their origin or in their developed form, as related to the mental life. So also the Automatic Theory advances science when it suggests as a constant problem the expression of all mental phenomena in those objective terms which can be made so much more definite than subjective expression ever is. But it impedes science when it discourages the specific study of mind in all the variety of its actual conditions and manifestations—for the sake of a premature and barren physiological deduction. Will any brooding over physiological data lead to anything but the most vague and general results in the way of psychological inference? Nobody who reflects will pretend that it can; and one must go farther and deny that even the vaguest psychological conclusion can be so obtained, unless with the physiological data there be coupled unawares some data of purely psychological, which is to say subjective, experience. I would not quarrel with the theory of Automatism on the ground most commonly taken. Though it gives a very inadequate expression to the infinite variety of circumstances determining human actions as viewed objectively, people must learn to be content with the plain truth that man, however he may be "man" (which is saying much), is not "master of his fate," but has his part and lot in the destiny of that—whatever it may be—which is called the physical world. But this truth is little towards all that we want to know of our strange double-sided human existence, and we cannot know more if our scientific activity is to be limited to such abstract theorising as finds expression in the doctrine of Automatism. Mental life can never be understood either in its essence or in its fullness, unless it is studied directly alike as it discloses itself to subjective introspection and as it is manifested more broadly in social relations and in the record of history.

The conclusion of the whole matter is that Psychology, however it may be related to biology, must be upheld as a perfectly distinct science—in no sense less distinct than chemistry is from physics, and in truth much more distinct because of the transition from the objective to the subjective point of view. And, returning to Mr. Lewes who has shown himself among the first—who claims indeed in his present preface to have been quite the first—to understand Psychology as the science of Mind in its wider implications, I cannot but venture the opinion that he has not now made all the use that might have been expected of his insight in dealing with the fallacy of "Animal Automatism".

EDITOR.

III.—THE USE OF HYPOTHESES.

THE thorough working out of that general view of the nature and province of Logic which, for the sake of brevity, may be termed the Material or Objective view, throws a new light upon, and therefore demands a reconsideration of, a good many detached points. Amongst these, as it seems to me, is the question of the nature and functions of Hypotheses.

We must first ascertain what, for the purposes of this inquiry, is to be understood by the term Hypothesis, especially since the use of the word in any kind of logical discussion will probably suggest a narrower limitation than that which will here be adopted. We need not strive after rigid accuracy, but half a page will be well expended if it aids in indicating what we have in view and in calling attention to various cautions which are often neglected. What will here be understood by the term, then, is, briefly speaking, nothing else than a mental representation, or conception of our own, which is either known or suspected not to be in accordance with actual facts. It would be a truism to say that for all ordinary purposes our conceptions should be in entire accordance with fact, so far as this is attainable. Often they are so, or are fully believed to be so, and they then go by various names according to conditions of time or mode of acquirement. If they refer to future events we might term them predictions or confident anticipations; if to the past, and within our own experience, recollections, and so on. Often, however, we have occasion to picture to ourselves a state of things which we deliberately contemplate as not-actual; it may be merely that the things are considered as uncertain, it may be that they are utterly and even whimsically false. With regard to their nature they may be either concrete facts, or groups of facts, or properties of bodies, or laws of connection or succession, which we thus picture to ourselves as other than they are. Such suppositions as these, in so far as they are seriously made for scientific or practical purposes, and not with any prominently æsthetic or humorous aim, may be roughly taken to correspond to 'hypotheses' as we are here concerned with them. The account thus sketched out may seem at first sight to have no very close connection with the term in many of its common significations; but it will be found, it is hoped, to be a consistent one, and we must trust for its justification to the discussion which follows.

The remarks just made imply the existence or assumption of a tolerably sharp distinction between the objective and the subjective, between the complex of external facts and our conceptions of them. This is, of course, distinctive of the Material view of Logic. We cannot pause to enter into any justification of such a view here, but shall postulate it for the present as being, if not philosophically unassailable, at any rate a perfectly tenable and consistent view for all purposes of science and therefore of logical inference.

It may serve to make our task plainer if we pause for a minute to consider what is the ideal towards which such a view or system of Logic tends; how would the world be represented to it if it had attained its ultimate state of perfection? If this state were attained every fact would be certain, that is potentially certain or capable of exact inference. The universe would be like a vast volume which happened to lie open before us at some page in the middle, but the leaves of which could readily be turned so as to enable us to consult and acquire with equal certainty the contents of any other page standing anywhere before or behind the one in question. Such a possible and accurate determination of all facts, past, present, or future, would be a necessary consequence of a complete determination and mastery of all the data requisite, and of all the laws of sequence and coexistence by which they are connected together. A well known passage in Mill's *Logic* intimates that this is to be regarded as the ideal of that branch of Material Logic which he terms Sociology, and it need hardly be remarked that what holds good of animate nature would *a fortiori* hold good of the inanimate or physical world.

Now supposing that this ideal were attained would there be any further occasion for Hypotheses? or, to put it otherwise, would the word 'if' have any meaning or use? At first sight it might almost seem as if there would be no such meaning or use. If all that we wanted was merely to call up before the mind, and contemplate, the absent, whether past or future, and this in a concrete form, 'if' would really have no place in the scientific vocabulary of such a perfected system of scientific logic. The absent events which the mind would thus succeed in calling up at will out of the boundless sea of time and space might doubtless be less vivid than those which were present to its direct consciousness, but they need be none the less certainly apprehended. Why then should those who could thus get a sure and certain hold of any fact they wanted go out of their way by supposing or hypothesising a state of things other than that which exists? Confident anticipations might be made about the future, just as recollections or records might be entertained of the past, but on the view in question the former would be no more suitable ground than the latter for an 'if' to grow and flourish in.

The obvious reply is that, although this attainment of facts which are remote from us in time or in space is one part of science, it is very far indeed from being the whole. We have much more to do than to construct, in the concrete, the course of history past and future. We have to get at the abstract, to analyse, and become acquainted with the laws of things. This would be the case even though our predictive power were complete, for we cannot know the concrete in complicated cases without a considerable progress in analysis; but with our present imperfect attainments it becomes more obviously necessary.

There seem to be three main reasons why we have occasion to indulge in hypotheses. They are obvious enough when stated, but their definite enunciation will suggest certain cautions in their employment which are often neglected.

In the first place, they are used for what may be called *constructive* purposes. When thus employed they are simply, so to say, a sort of framework or scaffold, useful in the process of erecting our edifice, but forming no integral part of it and therefore intended sooner or later to disappear. Our faculties being what they are, we can seldom succeed in tracing out remote consequences by direct deduction. Our only practicable course, when the problem is at all complicated, is to make assumptions or hypotheses, one after the other, and proceed to test them by experience. We make a variety of suppositions, ascertain, by experiment or reasoning, what would follow were they true, compare these consequences with the results which experience affords, and then reject and dismiss from the mind all those which have thus displayed their incorrectness.

Again, another use is simply *illustrative*, as when we employ hypotheses to familiarise ourselves or others with the bearing and the limits of any of the laws of nature. Such a use is a sort of fencing to which we have to resort in order to make ourselves thoroughly acquainted with the use of our weapons. These hypotheses, or problems as they are then generally called, are serviceable in accustoming us to every possible combination of events, so that we may be the better capable, when the time comes, to work out the consequences with which we shall be seriously concerned. The innumerable imaginary combinations which are introduced in problems in mathematics and the physical sciences have this purpose in view. In order to attain a clear comprehension of the bearing of a law or principle in the occasional and perhaps complicated combinations in which it is found in nature, we must work out the result which would follow from it in simpler imaginary examples.

The two above mentioned uses are by comparison speculative or scientific; with them may be contrasted the *practical* use. This latter arises out of the necessity of our being forewarned and forearmed against a great number of contingencies which may at one time or another come in our way. We find it useful to invent many imaginary combinations and to trace their consequences, because we cannot be sure but that some one or other of them may befall us. We are in fact simply making an approach to anticipating future experience. If we knew for certain in what form the experience would occur, we should only need to prepare ourselves for that particular form of it. The shape in which we pictured it to ourselves beforehand would then be called—not a hypothesis but—an anticipation. But this previous certainty is naturally in many cases unattainable. We can reach to nothing more than an alternative certainty; our knowledge being confined to the fact that some one or other of a given number of contingencies will occur, but which of them we cannot tell.

In reference to the first two of the above-mentioned employments, an important remark must be made. In each case alike, that change in what may be called the natural career of events, which is mentally introduced when we make the hypothesis, is arbitrary but perfectly determinate. We might rather say that it is determinate because it is arbitrary, a change which we introduce ourselves being in our own power to make it what we will. The framer of the hypothesis ought to be able to assign precisely the limits of the change which he contemplates, and to recognise that everything which he does not so change or which is not implicated in what he does so change, remains as it was and is left to develop itself according to its natural laws. Our hypothesis generally introduces some supposed definite alteration into the course of nature; an alteration consisting either in a variation of the laws which govern the events, or in the introduction of fresh events, or in the mutual collocations of existing events. Suppose, for instance, that we are discussing the consequences which would result from a variation in the velocity of rotation of the earth. We suppose the velocity, say, to be doubled, and then calculate the consequences;—that the shape of the earth itself might be altered, that the arrangement of land and water would be different, that changes of climate would thence ensue, and so on. Here, as we have said, the contemplated change is perfectly definite and assignable. We know exactly what we suppose to be altered, and how much, and assuming that the laws and collocations remain unaltered in other directions we trace the consequences of the proposed innovation. In physical science, at any rate, any haziness as to the precise limits of our hypothesis would never be tolerated.

Let us examine a case or two from the social and moral sciences, by way of illustration, beginning with Political Economy. Every one must have noticed how in this science the wildest suppositions are constantly made by sober writers: suppositions which no one would expect to see realised except in a world constructed out of a magnified Bedlam. Cases are put as to what would follow were all money abolished, were the amount in circulation instantly doubled, were all productive labourers to cease working for a given period, and so on without limit. Such hypotheses are perfectly admissible and often highly serviceable. Their function is explanatory. They are intended to explain the working of some general law, and for that purpose extreme instances will serve at least as well as any others, and often much better. They have too an important practical use within certain limits. Though Political Economy does not generally attempt to wander far from our present standing-point of time, it constantly does so to a short extent, especially into the immediate future. But owing to the great complication of many of the data upon which it has to rely, it can seldom venture upon such a step without much hesitation and uncertainty. It can only make its assertions in the alternative or hypothetical form. If so and so is the case, then such results will follow; if so and so, then such other results, and so on.

Turn now to Ethics. Here again we have general laws, at least on most theories of Ethics, and therefore all the range of their application is valid for the purpose of illustration. We are at liberty to discuss the consequences, from a moral point of view, of putting our pauper population to death, just as we might discuss the economical consequences of such a step. And yet the example would strike most minds as being in some way unwarrantable. Why so? The difference between such a supposition and those welcomed in Political Economy cannot be rested upon any such reason as that one of them is possible or practicable and that the other is not. If we mean by possible that the events are so far within human control that did the desire exist it would be followed by performance, of course both enterprises are equally possible. If, on the other hand, we term our event impossible merely because we feel perfectly certain that as a matter of fact it never will occur, then both are equally impossible. The distinction is doubtless partly to be sought in the strongly practical nature of Ethics even on the most speculative treatment. It consists prominently of rules such as we are all concerned with more or less every day of our lives. The perpetration of a murder, even against the person of a tyrant, falls more within the practical sphere of the average agent than does an over-issue of paper money or a large diversion of fixed capital into circulating. We get therefore to interpret our rules by their practical aims, and therefore resent examples which make violent or unlikely suppositions when more moderate ones would at all answer the purpose.

The foregoing cases are simple enough; let us now turn to History. What we mean here by the term is not so much the Philosophy of History, or Sociology, as the more ordinary narrative history. The former consists in great part of general rules applied to the particular course of events under discussion. It is therefore for most intents and purposes a branch of Ethics; it may be regarded as a sort of applied Ethics on a large scale. But in the simplest narration, if the historian be at all given to reflection, we shall often find an 'if' introduced into the story in a way which makes one ask what it means. "No one can doubt that the Roman Republic would have subsided into a military despotism if Julius Cæsar had never lived; but is it at all clear that in that case Gaul would ever have formed a province of the Empire?" Such imaginary contingencies are not the amusement of the frivolous. On the contrary some of the thoughtfullest and most practical of writers are as fond of them as any others. Mill says, in his essay *On Liberty:* "It is a bitter thought how different a thing the Christianity of the world might have been, if the Christian faith had been adopted as the religion of the empire under the auspices of Marcus Aurelius instead of those of Constantine".

Now is such a supposition as this a merely sportive exercise of the fancy, a sort of instantaneous romance, in fact, with no more practical or scientific aim than if a theologian were to set about guessing what might have happened had Adam been firmer in resisting temptation? Clearly there must be something to be gained either speculatively or practically by such an exercise of the inventive imagination. Some might express it by saying that the supposition of such a complete turn in the course of events is legitimate when the primary divergence contemplated is one that 'might have happened,' which was, to use the vulgar metaphor; 'on the cards'. This however fails to mark any philosophical distinction between the reasonable and unreasonable suppositions. In one sense, as already remarked, nothing could have happened otherwise than it did, for from unchanged antecedents the same consequences would always follow. And in another sense the events might have turned out other than they did, for in either case had the antecedents been changed so would the consequences.

I am disposed to think that we should find upon examination that the reasonable suppositions in such cases as these, as distinguished from the unreasonable and from those which are fanciful, fall mainly into two classes. One class of them are such as deal with the conduct of an individual only, or with a body of persons small enough to be likely to act in concert or be swayed by an individual will. We make our supposition about the behaviour of a king, a minister, or a parliament, rather than of any miscellaneous group. We ask, what if Luther had been less firm, if the Long Parliament had been more compliant, and so on; but not, what if such a nation or such a miscellaneous group of people had altered their course of action, or undergone a sudden change of sentiment. The other class of reasonable suppositions would be those which turn upon the use of some physical event which in conventional phrase 'might just as well have happened,' that is, which does not readily admit of being foreseen. The historian for instance would probably count it quite fair to speculate how European history would have been affected had a hurricane shattered the British fleet just before the battle of Trafalgar, or if Grouchy at Waterloo had been a little more rapid in his movements.

But what is the prerogative of such cases as these over others? That they can have nothing of what we have termed *constructive* value is obvious. When we indulge our fancy by framing such a hypothesis we are consciously stepping aside from the known course of events, we are postulating something which we are well aware did not happen; and we are doing this with no intention of becoming more certain as to what did happen. Nor can such suppositions claim to do much service in the way of *illustration*, at least not in any such sense as we have seen that they may help us in Political Economy. They are put in too concrete a form; they postulate too complicated a group of events for consideration. The consequences resulting from our supposition can never be more than guessed at, and unless they can be compared with the alternative and tested, there is no illustration gained by their employment.

The purpose they are really meant to subserve is, I apprehend, a *practical* one. It is quite compatible with this view that they are mostly found, not among future contingencies relevant to our own circumstances, but amongst those which are past and irrevocable, and often widely alien from anything likely to recur at the present day. For the study of history has with every one, to some extent, a prospective reference. Even if we do not consciously philosophise by generalising the laws whose working we are tracing, we are always on the look-out for precedents which have relevance to our own present and future needs. Consequences which turn upon the deeds of an individual, say the assassination of a ruler, are within the power of many other individuals. Those which turn upon the conduct of persons high in office are within the power of a sufficient number to give a certain practical value to the speculation.

It is not meant of course that these are the only circumstances under which the historian may put in an 'if'. But when he is dealing with occurrences so nearly unique, or so remote in some of their circumstances, that we can never expect to encounter anything similar to them, it appears to me that their interest must be rested on other than scientific grounds. It should rather be sought in that dramatic interest which induces us to fashion out a better life, more stirring incidents, or a more consistent career than that which truth compels us to accept. For a line or two the historian turns into the writer, or at least the suggester, of romance—a perfectly legitimate use of his powers but one which is æsthetic rather than scientific or practical.

But theologians also are sometimes given to meddling with suppositions. It appears to me that within their own department there is very little use in appealing to such a method, and indeed next to no meaning in their doing so. Take an instance or two. In discussions upon Ethics, or in controversies upon the evidential value of miracles, we may sometimes fall in with hypotheses such as these:—What ought men to do in case the Deity were to command a wicked action? What should they believe were a miracle worked in support of some immoral doctrine? To a heathen such questions might not be intrinsically absurd. If there are plenty of gods who are mostly little better than men in their moral character, no one could undertake to say what sort of commands might not proceed from them, and it might be well therefore to be prepared for contingencies of the kind. But to any believer in a perfect Being such hypotheses are idle. It is as if one were to ask a geometer to work out some of the consequences of supposing the focus of an ellipse to change its relative position. He would not quite understand what we meant, and would remind us that any such hypothesis as this was self-contradictory; that we were in fact postulating by implication an entirely new kind of curve but retaining the old and now inappropriate name for it. Moral attributes of a Deity must upon almost any view be regarded as essential, and therefore capable of none but slight modification.

These considerations seem to apply to any kind of ideal, theological or ethical. Such ideals must always imply and be grounded upon a very complicated synthesis of intuitions, emotions and inductions. Now to conceive a serious alteration in any important group of these supports would by implication demand a reconsideration of the whole synthesis. What was supposed to be removed or changed would react on what was left (as it was thought) untouched; would disturb its balance, perhaps break up its cohesion, and thence bring about a profound alteration of the ideal itself. When speculations are indulged in as to what would follow were the popular belief in immortality to be changed or abandoned, it is not always remembered that there is a good deal more to be thought of than the *consequences* of such a change of belief. To suppose the change at all is in effect to presuppose a change in many other directions. It could only have come about by such a disturbance of the common foundations as would cause a very serious resettlement in other directions as well. In other words, if we please to put the hypothesis of a total change in some one moral or theological principle we ought in logical consistency to reconsider the question from a prior point of view, and try to ascertain what sort of concurrent changes we have tacitly supposed amongst those which are left.

It was pointed out that for any hypothesis to be admissible its precise limits must be determined, and if needful be stated. In Political Economy, for instance, it is easy, to an only slightly less extent than in physical science, to be thus precise. We are dealing with men and their institutions in a somewhat abstract form, and when we postulate an alteration of motive or innovation in practice (as we always must do in such problems as those in question) we are able to conceive precisely the amount of change hypothetically contemplated, and to take good care that we do not thereby unconsciously introduce further changes which were not contemplated. But in Theology, in Ethics, in fact in any subject where man has to be regarded with the infinitely varied interaction of innumerable motives, such precision is altogether unattainable.

In their familiar form such hypotheses are often merely an indirect way of urging a recommendation. "If only the clergy would abandon their disputes and unite to oppose immorality and irreligion, what a mighty effect might they produce!" True, but why not say at once: "If the immoral and irreligious themselves changed their practice and their views?" Then we should have the end without needing to trouble ourselves about securing one particular means towards it. What is really meant is to address a bit of exhortation, and it is thought more hopeful to address it to a limited body, by reminding them of their influence for good or evil, than by letting it waste its force by a too indiscriminate application. In strictness our hypothesis is idle. We could not really suppose a change of sentiment affecting some thousands of persons (the clergy in question) without some sort of supposition as to how it could have come about. We should then perceive that we had had to assume a change of training and of thought in their case, and of feeling and judgment in those about them, which carried along with it by implication a good deal of that resultant change which was supposed to be circuitously effected through their agency.

There is another way in which hypotheses enter into ethical inquiries, which deserves notice, as it not unfrequently confounds together two very different classes of cases. The attempt is often made to deter any one from performing some particular action, or at least to demonstrate its pernicious character, by exhibiting the action on a large scale. "Only see," it is said, "what would follow, if all men or a great many, were to do so." I propose to pluck a bunch of grapes in a field through which I pass, and urge in defence that the owner will never miss that one. "Quite true," it is often replied, "but only see what would come of it if every one did the same, the owner would be ruined by the year's end." There is nothing wrong in this mode of illustration if no more is meant by it than to exhibit on a large scale what might fail to secure attention on a small scale. The consequences may be thus forced home upon an obtuse and selfish mind. But nothing is proved; nothing is shown which an acute and impartial mind might not equally have seen without the help of any supposition. It is as if I wished to prove that even a glass of water taken from a pond would lower the level of the surface. Some one, say, is tempted to doubt the fact. But he must admit that the deduction of a few hogsheads would produce a perceptible result, and can persuade himself therefore that a similar though very small effect would result even from the loss of a glassful.

But it is surely inconsistent to admit that in the individual case the good of the action outweighs the evil, and yet to claim that on the large scale these consequences are reversed. Magnify the good and the evil to any extent we please, but their proportions to one another will not be altered if they are magnified equally. Mr. Austin, for instance, argues thus:—"If I evade the payment of a tax imposed by a good Government, the *specific* effects of the mischievous forbearance are indisputably useful. For the money which I unduly withhold is convenient to myself, and compared with the bulk of the public revenue is a quantity too small to be missed. But the regular payment of taxes is necessary to the existence of the Government. And I, and the rest of the community, enjoy the security which it gives, because the payment of taxes is rarely evaded."

If we judge by consequences only I do not think that this line of reasoning would keep me from smuggling. It is not easy to see how a series of actions each of which is to yield a result of positive good are somehow to add up into a total which is negative. It is assumed, say, that by keeping £10 to myself, the balance of happiness is increased, since the consequent increase of comfort to myself by its detention is greater than the consequent diminution to the community by its expenditure for them. But this plea of the first defrauder is equally open to the second and to those who come after him. If the taxes of a thousand persons are lost, just one thousand persons are rendered happier by having the money to spend as they please. Would it not be sounder to argue thus—"By defrauding the revenue of £10 you *do* injure the community; you cause more injury to others than you cause happiness to yourself". The surface of happiness, so to say, which you want to skim from the rest of society and to put into your own cup, is thin, no doubt, but it is very broad, and it makes up in area what it loses in depth. You cannot gain in this way without others losing, whether they know it or not.

There is another class of cases, a reference to which will show us how very misleading a test is furnished by an examination of the consequences of such a hypothetical extension of the action upon a large scale. A father, say, is proposing to train his son to enter the ministry. A friend seeks to dissuade him upon the plea that if all took this line it would be highly injurious, that production would come to a complete standstill, and so on. What would his reply be? Naturally he replies that his conduct must be judged separately; that if too many adopt the particular course in question, he for one will cease to do so. But if actions are to be judged by their consequences only, there is little or no formal difference between the line of argument adopted in this case and in those previously under discussion. The fact is that though something may be *illustrated*, nothing can really be *proved* by framing and contemplating the supposition of similar actions upon a large scale. If performance upon a small scale has mischievous consequences, performance upon a large scale will almost necessarily have consequences still more mischievous and therefore more obvious. But we cannot convert this line of reasoning and argue that, because identity of action by a multitude is disastrous, that therefore the same action when performed by the individual must be forbidden as pernicious.

The same remarks apply to many important affairs in life. Suppose I had been an African merchant engaged in the slave trade: suppose moreover that the test of actions is to be sought in their consequences only, neglecting all the potent indirect influences which depend upon sympathy with a good cause, and with the struggle towards an ideal. I take my stand upon this ground:—I quite admit that the slave trade is a grievous injury to the human race. I have no objection to its total suppression, in fact I would readily aid in procuring this suppression. But, so long as the trade is permitted, the fact of my carrying on the business does no direct harm to any one, at least in the way in question. I do not even really add to the total number of slaves imported, for, by the well known laws of supply and demand, if the number of traders in any direction is artificially diminished profits will rise, and others be attracted into the business. To make any rational appeal to a man upon the consequences of his actions, we must try to convince him, not by pointing out what would happen if something else were to come about, but by showing him what *will* result from his conduct. We may appeal to his self-interest by maintaining that it is the worse for him to transgress any law divine or human, or to blunt his conscience, or we may appeal to his sympathetic feelings by showing that every one who triumphs over the love of gain is a help to humanity and may do good by his example. These are rational appeals, but they do not involve any imaginary hypothesis.

Hypotheses are constantly implied even where they are not explicitly stated. This is the case when judgment is passed upon the conduct of an individual or body of persons. On any theory of ethics, to blame an agent must imply that we contrast the conduct he really did pursue with other conduct which he might have pursued. When we say that he did wrong, the same idea may be conveyed by saying, had he done so and so instead he would have done right, or at least have done better. And when the consequences of his conduct are the only element taken into account, we may translate our condemnation into the terms—"If so and so had been done instead, then the consequences would have been certainly or probably better." That is, we are ready on demand with some hypothetical line of conduct different from the actual. But here comes in the difficulty already mentioned. To make the comparison a sound one we ought to contrast his own actual conduct with some hypothetical alternative which is equally limited in its application to his individual case. Nothing is proved by contrasting what he did with that which some *class* to which he is referred, perhaps rather arbitrarily, might have done.

Examples need not be multiplied; but I think that any one who contemplates Political Economy ethically, that is who tries to deduce rules good for the individual agent from the general conclusions of that science will find plenty of illustrations of what has just been advanced. Conduct is sometimes good (or bad) alike when done by the many or by the few. This is the ground mainly occupied by Ethics, though it is but a portion of human conduct, and therefore corresponds to a portion only of the general art of adding to human happiness. Sometimes, again, conduct is bad when pursued by the many, but good for the few. This is often the case in Political Economy, and is connected with the advocacy of the *laissez faire* principle, and with the great practical difficulty which is so often felt when we try to guide ourselves ethically by the conclusions of economists. Sometimes, again, the result is good if all without exception combine, either by consent or under compulsion, to do the same; but the infringement by but a very few will destroy all good result as effectually as a general permission. In such cases the economist is driven to appeal to the State for aid.

In the last case we are led to the apparently paradoxical conclusion that it is logically consistent, when consequences are the test, to blame a body of persons collectively, but to absolve them each individually. This is the case when we see that the whole body, by combining, might abolish some injurious practice. We then compare what that body does do with what it might do, and blame it accordingly. But till the members do combine we cannot say the same to them individually. When we picture what would follow did a few abstain, we see not merely an insignificant gain, but no gain at all; for what they leave undone others will certainly make up.

When therefore we test the character of an action by its hypothetical generalisation, that is by seeing what would follow were it performed by many or by all, the test becomes very untrustworthy, for the cases to which we may have to apply it are widely distinct.

Those who are familiar with the science of Ethics will of course have noticed already that we have touched incidentally upon some of Kant's doctrines. He repeatedly lays down, as a test to the individual agent of the rightness of his conduct—Can you will the maxim according to which you act to be a law universal to mankind? There seems to be more than one objection to the validity of such a test. For one thing it assumes that there is but one maxim, or but one that is thoroughly appropriate, to which the action is to be referred, for it speaks of *the* maxim according to which we act; whereas any particular action will always admit of reference to an indefinite number of maxims according to the degree of particularity with which we specify the characteristics of the action. But passing this over, the question, What would follow if all men were to do as I do? can surely never lead to an answer which will give a certain test of the goodness or otherwise of the action. If the test is to be at all serviceable it must mean that the *consequences* of the act would be bad when we suppose it thus generalised, for to confine it to those cases in which the action, so generalised, would not merely involve bad results but become self-inconsistent or downright absurd, would be to limit its applicability to a very small portion indeed of the field of Ethics as commonly understood. But, as above remarked, this way of looking at the matter confounds several widely different cases. Sometimes it serves to illustrate on the large scale consequences which should really be visible also on the small scale; but then the action here must really admit of examination by itself. But often when the action would be pernicious on the large scale, the agent is at liberty to reply: "I do in part because all others *do not*, and I should begin to change my practice if I saw them begin to imitate generally my example". And finally, when the general consequences would be beneficial, he may sometimes say: "Yes, I know it would be better if we all combined for the purpose, but till I see some signs of such a combination there is no need for me just to sacrifice myself for a formula".

J. VENN.

IV.—ON THE NATURE OF THINGS-IN-THEMSELVES.

Meaning of the Individual Object.

My feelings arrange and order themselves in two distinct ways. There is the internal or subjective order, in which sorrow succeeds the hearing of bad news, or the abstraction "dog" symbolises the perception of many different dogs. And there is the external or objective order, in which the sensation of letting go is followed by the sight of a falling object and the sound of its fall. The objective order, *quâ* order, is treated by physical science, which investigates the uniform relations of *objects* in time and space. Here the word *object* (or *phenomenon*) is taken merely to mean a group of my feelings, which persists as a group in a certain manner; for I am at present considering only the objective order of my feelings. The object, then, is a set of changes *in* my consciousness, and not anything out of it. Here is as yet no metaphysical doctrine, but only a fixing of the meaning of a word. We may subsequently find reason to infer that there is something which is not object, but which corresponds in a certain way with the object; this will be a metaphysical doctrine, and neither it nor its denial is involved in the present determination of meaning. But the determination must be taken as extending to all those inferences which are made by science in the objective order. If I hold that there is hydrogen in the sun, I mean that if I could get some of it in a bottle, and explode it with half its volume of oxygen, I should get that group of possible sensations which we call "water". The inferences of physical science are all inferences of my real or possible feelings; inferences of something actually or potentially in my consciousness, not of anything outside it.

Distinction of Object and Eject.

There are, however, some inferences which are profoundly different from those of physical science. When I come to the conclusion that *you* are conscious, and that there are objects in your consciousness similar to those in mine, I am not inferring any actual or possible feelings of my own, but *your* feelings, which are not, and cannot by any possibility become, objects in my consciousness. The complicated processes of your body and the motions of your brain and nervous system, inferred from evidence of anatomical researches, are all inferred as things possibly visible to me. However remote the inference of physical science, the thing inferred is always a part of me, a possible set of changes in my consciousness bound up in the objective order with other known changes. But the inferred existence of your feelings, of objective groupings among them similar to those among my feelings, and of a subjective order in many respects analogous to my own,—these inferred existences are in the very act of inference *thrown out* of my consciousness, recognised as outside of it, as *not* being a part of me. I propose, accordingly, to call these inferred existences *ejects*, things thrown out of my consciousness, to distinguish them from *objects*, things presented in my consciousness, phenomena. It is to be noticed that there is a set of changes of my consciousness symbolic of the eject, which may be called my conception of you; it is (I think) a rough picture of the whole aggregate of my consciousness, under imagined circumstances like yours; *quâ* group of my feelings, this conception is like the object in substance and constitution, but differs from it in implying the existence of something that is not itself, but corresponds to it, namely, of the eject. The existence of the object, whether perceived or inferred, carries with it a group of beliefs; these are always beliefs in the future sequence of certain of my feelings. The existence of this table, for example, as an object in my consciousness, carries with it the belief that if I climb up on it I shall be able to walk about on it as if it were the ground. But the existence of my conception of you in my consciousness carries with it a belief in the existence of you outside of my consciousness, a belief which can never be expressed in terms of the future sequence of my feelings. How this inference is justified, how consciousness can testify to the existence of anything outside of itself, I do not pretend to say; I need not untie a knot which the world has cut for me long ago. It may very well be that I myself am the only existence, but it is simply ridiculous to suppose that anybody else is. The position of absolute idealism may, therefore, be left out of count, although each individual may be unable to justify his dissent from it.

Formation of the Social Object.

The belief, however, in the existence of other men's consciousness, in the existence of ejects, dominates every thought and every action of our lives. In the first place, it profoundly modifies the object. This room, the table, the chairs, your bodies, are all objects in my consciousness; as simple objects, they are parts of me. But I, somehow, infer the existence of similar objects in your consciousness, and these are not objects to me, nor can they ever be made so; they are ejects. This being so, I bind up with each object as it exists in my mind the thought of similar objects existing in other men's minds; and I thus form the complex conception, "this table, as an object in the minds of men,"—or, as Mr. Shadworth Hodgson puts it, an object of consciousness in general. This conception symbolises an indefinite number of ejects, together with one object which the conception of each eject more or less resembles. Its character is therefore mainly ejective in respect of what it symbolises, but mainly objective in respect of its nature. I shall call this complex conception the *social object;* it is a symbol of one thing (the *individual object,* it may be called for distinction's sake) which is in my consciousness, and of an indefinite number of other things which are ejects and out of my consciousness. Now, it is probable that the individual object, as such, never exists in the mind of man. For there is every reason to believe that we were gregarious animals before we became men properly so called. And a belief in the eject—some sort of recognition of a kindred consciousness in one's fellow-beings—is clearly a condition of gregarious action among animals so highly developed as to be called conscious at all. Language, even in its first beginnings, is impossible without that belief; and any sound which, becoming a sign to my neighbour, becomes thereby a mark to myself, must by the nature of the case be a mark of the social object, and not of the individual object. But if not only this conception of the particular social object, but all those that have been built up out of it, have been formed at the same time with, and under the influence of, language, it seems to follow that the belief in the existence of other men's minds like our own, but not part of us, must be inseparably associated with every process whereby discrete impressions are built together into an object. I do not, of course, mean that it presents itself in consciousness as distinct; but I mean that as an object is formed in my mind, a fixed habit causes it to be formed as social object, and insensibly embodies in it a reference to the minds of other men. And this sub-conscious reference to supposed ejects is what constitutes the impression of *externality* in the object, whereby it is described as *not-me.* At any rate, the formation of the social object supplies an account of this impression of outness, without requiring me to assume any ejects or things outside my consciousness except the minds of other men. Consequently, it cannot be argued from the impression of outness that there is anything outside of my consciousness except the minds of other men. I shall argue presently that we have grounds for believing in non-personal ejects, but these grounds are not in any way dependent on the impression of outness, and they are not included in the ordinary or common-sense view of things. It seems to me that the prevailing belief of uninstructed people is merely a belief in the social object, and not in a non-personal eject, somehow corresponding to it; and that the question "Whether the latter exists or not?" is one which cannot be put to them so as to convey any meaning without considerable preliminary training. On this point I agree entirely with Berkeley, and not with Mr. Spencer.

Difference between Mind and Body.

I do not pause to show how belief in the Eject underlies the whole of natural ethic, whose first great commandment, evolved in the light of day by healthy processes wherever men have lived together, is, "Put yourself in his place". It is more to my present purpose to point out what is the true difference between body and mind. Your body is an object in my consciousness; your mind is not, and never can be. Being an object, your body follows the laws of physical science, which deals with the objective order of my feelings. That its chemistry is ordinary chemistry, its physics ordinary physics, its mechanics ordinary mechanics, may or may not be true; the circumstances are exceptional, and it is conceivable (to persons ignorant of the facts) that allowance may have to be made for them, even in the expression of the most general laws of nature. But in any case, every question about your body is a question about the physical laws of matter, and about nothing else. To say: "Up to this point science can explain; here the soul steps in," is not to say what is untrue, but to talk nonsense. If evidence were found that the matter constituting the brain behaved otherwise than ordinary matter, or if it were impossible to describe vital actions as particular examples of general physical rules, this would be a fact in physics, a fact relating to the motion of matter; and it must either be explained by further elaboration of physical science, or else our conception of the objective order of our feelings would have to be changed. The question, "Is the mind a force?" is condemned by similar considerations. A certain variable quality of matter (the rate of change of its motion) is found to be invariably connected with the position relatively to it of other matter; considered as expressed in terms of this position, the quality is called Force. Force is thus an abstraction relating to *objective* facts; it is a mode of grouping of my feelings, and cannot possibly be the same thing as an eject, another man's consciousness. But the question: "Do the changes in a man's consciousness *run parallel* with the changes of motion, and therefore with the forces in his brain?" is a real question, and not *primâ facie* nonsense. Objections of like character may be raised against the language of some writers, who speak of changes in consciouness as *caused* by actions on the organism. The word *Cause, πολλαχῶς λεγόμενον* and misleading as it is, having no legitimate place in science or philosophy, may yet be of some use in conversation or literature, if it is kept to denote a relation between objective facts, to describe certain parts of the phenomenal order. But only confusion can arise if it is used to express the relation between certain objective facts in my consciousness, and the ejective facts which are inferred as corresponding in some way to them and running parallel with them. For all that we know at present, this relation does not in any way resemble that expressed by the word Cause.

To sum up, the distinction between eject and object, properly grasped, forbids us to regard the eject, another man's mind, as coming into the world of objects in any way, or as standing in the relation of cause or effect to any changes in that world. I need hardly add that the facts do very strongly lead us to regard our bodies as merely complicated examples of practically universal physical rules, and their motions as determined in the same way as those of the sun and the sea. There is no evidence which amounts to a *primâ facie* case against the dynamical uniformity of Nature; and I make no exception in favour of that *slykick* force which fills existing lunatic asylums and makes private houses into new ones.

Correspondence of Elements of Mind and Brain-Action.

I have already spoken of certain ejective facts—the changes in your consciousness—as running parallel with the changes in your brain, which are objective facts. The parallelism here meant is a parallelism of complexity, an analogy of structure. A spoken sentence and the same sentence written are two utterly unlike things, but each of them consists of elements; the spoken sentence of the elementary sounds of the language, the written sentence of its alphabet. Now the relation between the spoken sentence and its elements is very nearly the same as the relation between the written sentence and its elements. There is a correspondence of element to element; although an elementary sound is quite a different thing from a letter of the alphabet, yet each elementary sound belongs to a certain letter or letters. And the sounds being built up together to form a spoken sentence, the letters are built up together, *in nearly the same way*, to form the written sentence. The two complex products are as wholly unlike as the elements are, but the manner of their complication is the same. Or, as we should say in the mathematics, a sentence spoken is the same function of the elementary sounds as the same sentence written is of the corresponding letters.

Of such a nature is the correspondence or parallelism between mind and body. The fundamental "deliverance" of consciousness affirms its own complexity. It seems to me impossible, as I am at present constituted, to have only one absolutely simple feeling at a time. Not only are my objective perceptions, as of a man's head or a candlestick, formed of a great number of parts ordered in a definite manner, but they are invariably accompanied by an endless string of memories, all equally complex. And those massive organic feelings with which, from their apparent want of connection with the objective order, the notion of consciousness has been chiefly associated,—those also turn out, when attention is directed to them, to be complex things. In reading over a former page of my manuscript, for instance, I found suddenly, on reflection, that although I had been conscious of what I was reading, I paid no attention to it; but had been mainly occupied in debating whether faint red lines would not be better than blue ones to write upon, in picturing the scene in the shop when I should ask for such lines to be ruled, and in reflecting on the lamentable helplessness of nine men out of ten when you ask them to do anything slightly different from what they have been accustomed to do. This debate had been started by the observation that my handwriting varied in size according to the nature of the argument, being larger when that was diffuse and explanatory, occupied with a supposed audience; and smaller when it was close, occupied only with the sequence of propositions. Along with these trains of thought went the sensation of noises made by poultry, dogs, children, and organ-grinders; and that vague diffused feeling in the side of the face and head which means a probable toothache in an hour or two. Under these circumstances, it seems to me that consciousness must be described as a succession of groups of changes, as analogous to a rope made of a great number of occasionally interlacing strands.

This being so, it will be said that there is a unity in all this complexity, that in all these varied feelings it is I who am conscious, and that this sense of personality, the self-perception of the Ego, is one and indivisible. It seems to me (here agreeing with Hume) that the "unity of apperception" does not exist in the instantaneous consciousness which it unites, but only in subsequent reflection upon it; and that it consists in the power of establishing a certain connection between the memories of any two feelings which we had at the same instant. A feeling, at the instant when it exists, exists *an und für sich,* and not as *my* feeling; but when on reflection I remember it as my feeling, there comes up not merely a faint repetition of the feeling, but inextricably connected with it a whole set of connections with the general stream of my consciousness. This memory, again, *quâ* memory, is relative to the past feeling which it partially recalls; but in so far as it is itself a feeling, it is absolute, *Ding-an-sich.* The feeling of personality, then, is a certain feeling of connection between faint images of past feelings; and personality itself is the fact that such connections are set up, the property of the stream of feelings that part of it consists of links binding together faint reproductions of previous parts. It is thus a relative thing, a mode of complication of certain elements, and a property of the complex so produced. This complex is consciousness. When a stream of feelings is so compacted together that at each instant it consists of (1) new feelings, (2) fainter repetitions of previous ones, and (3) links connecting these repetitions, the stream is called a consciousness. A far more complicated grouping than is necessarily implied here is established when discrete impressions are run together into the perception of an object. The *conception* of a particular object, as object, is a group of feelings, symbolic of many different perceptions, and of links between them and other feelings. The distinction between Subject and Object is twofold; first, the distinction with which we started between the subjective and objective *orders* which simultaneously exist in my feelings; and secondly, the distinction between me and the social object, which involves the distinction between me and you. Either of these distinctions is exceedingly complex and abstract, involving a highly organised experience. It is not, I think, possible to separate one from the other; for it is just the objective order which I do suppose to be common to me and to other minds.

I need not set down here the evidence which shows that the complexity of consciousness is paralleled by complexity of action in the brain. It is only necessary to point out what appears to me to be a consequence of the discoveries of Müller and Helmholtz in regard to sensation: that at least those distinct feelings which can be remembered and examined by reflection are paralleled by changes in a portion of the brain only. In the case of sight, for example, there is a message taken from things outside to the retina, and therefrom sent in somewhither by the optic nerve; now we can tap this telegraph at any point and produce the sensation of sight, without any impression on the retina. It seems to follow that what is known *directly* is what takes place at the inner end of this nerve, or that the consciousness of sight is simultaneous and parallel in complexity with the changes in the grey matter at the internal extremity, and not with the changes in the nerve itself, or in the retina. So also a pain in a particular part of the body may be mimicked by neuralgia due to lesion of another part.

We come, finally, to say then that as your consciousness is made up of elementary feelings grouped together in various ways (ejective facts), so a part of the action in your brain is made up of more elementary actions in parts of it, grouped together *in the same ways* (objective facts). The knowledge of this correspondence is a help to the analysis of both sets of facts; but it teaches us in particular that any feeling, however apparently simple, which can be retained and examined by reflection, is already itself a most complex structure. We may, however, conclude that this correspondence extends to the elements, and that each simple feeling corresponds to a special comparatively simple change of nerve-matter.

The Elementary Feeling is a Thing-in-itself.

The conclusion that elementary feeling co-exists with elementary brain-motion in the same way as consciousness co-exists with complex brain-motion, involves more important consequences than might at first sight appear. We have regarded consciousness as a complex of feelings, and explained the fact that the complex is conscious, as depending on the mode of complication. But does not the elementary feeling itself imply a consciousness in which alone it can exist, and of which it is a modification? Can a feeling exist by itself, without forming part of a consciousness? I shall say *no* to the first question, and *yes* to the second, and it seems to me that these answers are required by the doctrine of evolution. For if that doctrine be true, we shall have along the line of the human pedigree a series of imperceptible steps connecting inorganic matter with ourselves. To the later members of that series we must undoubtedly ascribe consciousness, although it must, of course, have been simpler than our own. But where are we to stop? In the case of organisms of a certain complexity, consciousness is inferred. As we go back along the line, the complexity of the organism and of its nerve-action insensibly diminishes; and for the first part of our course, we see reason to think that the complexity of consciousness insensibly diminishes also. But if we make a jump, say to the tunicate molluscs, we see no reason there to infer the existence of consciousness at all. Yet not only is it impossible to point out a place where any sudden break takes place, but it is contrary to all the natural training of our minds to suppose a breach of continuity so great. All this imagined line of organisms is a series of objects in my consciousness; they form an insensible gradation, and yet there is a certain unknown point at which I am at liberty to infer facts *out* of my consciousness corresponding to them! There is only one way out of the difficulty, and to that we are driven. Consciousness is a complex of ejective facts,—of elementary feelings, or rather of those remoter elements which cannot even be felt, but of which the simplest feeling is built up. Such elementary ejective facts go along with the action of every organism, however simple; but it is only when the material organism has reached a certain complexity of nervous structure (not now to be specified) that the complex of ejective facts reaches that mode of complication which is called Consciousness. But as the line of ascent is unbroken, and must end at last in inorganic matter, we have no choice but to admit that every motion of matter is simultaneous with some ejective fact or event which might be part of a consciousness. From this follow two important corollaries.

1. A feeling can exist by itself, without forming part of a consciousness. It does not depend for its existence on the consciousness of which it may form a part. Hence a feeling (or an eject-element) is *Ding-an-sich*, an absolute, whose existence is not relative to anything else. *Sentitur* is all that can be said.
2. These eject-elements, which correspond to motions of matter, are connected together in their sequence and co-existence by counterparts of the physical laws of matter. For otherwise the correspondence could not be kept up.

Mind-stuff is the reality which we perceive as Matter.

That element of which, as we have seen, even the simplest feeling is a complex, I shall call *Mind-stuff.* A moving molecule of inorganic matter does not possess mind, or consciousness; but it possesses a small piece of mind-stuff. When molecules are so combined together as to form the film on the under side of a jelly-fish, the elements of mind-stuff which go along with them are so combined as to form the faint beginnings of Sentience. When the molecules are so combined as to form the brain and nervous system of a vertebrate, the corresponding elements of mind-stuff are so combined as to form some kind of consciousness; that is to say, changes in the complex which take place at the same time get so linked together that the repetition of one implies the repetition of the other. When matter takes the complex form of a living human brain, the corresponding mind-stuff takes the form of a human consciousness, having intelligence and volition.

Suppose that I see a man looking at a candlestick. Both of these are objects, or phenomena, in my mind. An *image* of the candlestick, in the optical sense, is formed upon his retina, and nerve messages go from all parts of this to form what we may call a *cerebral image* somewhere in the neighbourhood of the optic thalami in the inside of his brain. This cerebral image is a certain complex of disturbances in the matter of these organs; it is a material or physical fact, therefore a group of my possible sensations, just as the candlestick is. The cerebral image is an imperfect representation of the candlestick, corresponding to it point for point in a certain way. Both the candlestick and the cerebral image are matter; but one material complex *represents* the other material complex in an imperfect way.

Now the candlestick is not the external reality whose existence is represented in the man's mind; for the candlestick is a mere perception in *my* mind. Nor is the cerebral image the man's perception of the candlestick; for the cerebral image is merely an idea of a possible perception in my mind. But there *is* a perception in the man's mind, which we may call the *mental image;* and this corresponds to some external reality. *The external reality bears the same relation to the mental image that the (phenomenal) candlestick bears to the cerebral image.* Now the candlestick and the cerebral image are both matter; they are made of the same stuff. Therefore the external reality is made of the same stuff as the man's perception or mental image, that is, it is made of mind-stuff. And as the cerebral image represents imperfectly the candlestick, in the same way and to the same extent the mental image represents the reality external to his consciousness. Thus in order to find the thing-in-itself which is represented by any object in my consciousness such as a candlestick, I have to solve this question in proportion, or rule of three:—

> *As* the physical configuration of my cerebral image of the object
> *is to* the physical configuration of the object,
> *so is* my perception of the object (the object regarded as complex of my feelings)
> *to* the thing-in-itself.

Hence we are obliged to identify the thing-in-itself with that complex of elementary mind-stuff which on other grounds we have seen reason to think of as going along with the material object. Or, to say the same thing in other words, the reality external to our minds which is represented in our minds as matter, is in itself mind-stuff.

The universe, then, consists entirely of mind-stuff. Some of this is woven into the complex form of human minds containing imperfect representations of the mind-stuff outside them, and of themselves also, as a mirror reflects its own image in another mirror, *ad infinitum.* Such an imperfect representation is called a material universe. It is a picture in a man's mind of the real universe of mind-stuff.

The two chief points of this doctrine may be thus summed up:—

Matter is a mental picture in which mind-stuff is the thing represented.

Reason, intelligence, and volition are properties of a complex which is made up of elements themselves not rational, not intelligent, not conscious.

W. K. CLIFFORD.

NOTE.—The doctrine here expounded appears to have been arrived at independently by many persons; as was natural, seeing that it is (or seems to me) a necessary consequence of recent advances in the theory of perception. Kant threw out a suggestion that the *Ding-an-sich* might be of the nature of mind; but the first statement of the doctrine in its true connection that I know of, is by Wundt. Since it dawned on me, some time ago, I have supposed myself to find it more or less plainly hinted in many writings; but the question is one in which it is peculiarly difficult to make out precisely what another man means, and even what one means one's self.

Some writers (*e.g.*, Dr. Tyndall) have used the word *matter* to mean the phenomenon *plus* the reality represented; and there are many reasons in favour of such usage in general. But for the purposes of the present discussion I have thought it clearer to use the word for the phenomenon as distinguished from the thing-in-itself.

W. K. C.

V.—THE PHILOSOPHY OF ETHICS.

ETHICS is a subject which has suffered a somewhat singular fate: for whereas on its practical side there has been a more perfect agreement about it than about any other important branch of human knowledge, on its speculative side it has been, and it still is, the centre of apparently endless controversy—the subject of every species of confusion. In the course of the following remarks, which, though they must add to the controversy, will not, I hope, add to the confusion, I have attempted a treatment of the second or speculative side. I have not tried either to attack any old system, or to enunciate a new one. My sole aim has been to lay down the general lines to which *any* legitimate system must conform, and to point out as precisely as possible the relation which Ethics bears to other subjects of inquiry, and the kind of proof of which its propositions are susceptible. In doing so I have been compelled to begin with some general observations which may seem of disproportionate length when compared with the more strictly ethical part of the inquiry, but which cannot be omitted without in some degree prejudicing the clearness of what is to follow.

I.

Everything that we know, or think we know, may be classed under one of four heads, which, without departing very widely from ordinary usage, may be named thus: Science, Ontology, Ethics, and Philosophy. By Science is meant here, not only what commonly goes by that name, but also history, and knowledge of particular matters of fact: so that "knowledge of phenomena and the relations subsisting between phenomena" would be a more accurate, though less convenient, expression for what is intended. In Ontology is included not only Theology and all doctrines of the Absolute, but also (and this is not necessarily the same thing) all real or supposed knowledge of entities which are not phenomenal.

What is meant by Ethics will be shown in detail later on. Here it is only necessary to say that it includes not only what are commonly called moral systems, but also some analogous systems not usually so described.

Multitudes of propositions, all professing to embody knowledge belonging to one of these departments, are being continually put forward for our acceptance. And as no one believes all of them, so those who profess to act rationally must hold that there are grounds for rejecting the propositions they disbelieve, and for accepting those they believe. The systematic account of these grounds of belief and disbelief makes up the fourth of the classes into which possible knowledge is divided, and is here always called Philosophy.

If it be objected that this is not the common meaning of the term, I reply that it would be difficult to point out what the common meaning is. It has been used, perhaps most frequently in England, as being equivalent to Psychology, which is a department of science. But researches after the absolute are also called philosophical, and these belong to Ontology. Ethics is sometimes called moral philosophy, as science is sometimes called natural philosophy; while Logic, which a very common usage regards as a branch of philosophy, would, as I shall presently explain, be included in it also by my definition. So that there cannot, on the whole, be much harm in using the term to represent a definite subject of investigation for which there is no other word. In this sense it is not very different from what Kant called Critical Philosophy.

It follows directly from this definition that, however restricted the range of possible knowledge may be, philosophy can never be excluded from it. For unless the restriction be purely arbitrary, there must be reasons for it; and it is the systematic account of these reasons which is here called Philosophy. So that even if it should turn out that Metaphysics is an illusion, and only "positive" knowledge is attainable, this discovery would be so far from destroying philosophy that it is only by philosophy that it could be established.

If mankind was in the condition of believing *nothing* and, without a bias in any particular direction, was merely on the look-out for some legitimate creed, it would not, I conceive, be possible, *à priori*, to name any of the positive characteristics which the philosophy corresponding to that creed must necessarily possess. But since this is by no means the case, since everybody has a certain number of scientific beliefs, and most people have a certain number of ethical and ontological (theological) ones, it may be possible to describe some of the attributes which should be found in a philosophy professing to support these provisional conclusions.

For example, since no one supposes that all the propositions we believe are self-evident, it may be assumed that the greater number of them are legitimate inferences from propositions which *are* self-evident. And from this it follows that philosophy must consist of two main departments, one of which deals with these ultimate or self-evident propositions, the other with modes of inference.

I do not forget that some writers have held that the truth of a system is to be inferred, not from any self-evident propositions lying at its root, but from the consistency and coherence of its parts, though each of these taken by itself is by no means self-evident. Of such a system it would apparently be incorrect to say that one part is ultimate, and another derivative; it ought rather to be said that the truth of the whole is an inference from the consistency of the parts, and the truth of the parts is an inference from the truth of the whole. But even on this theory the formula above stated holds good, for such systems so far from being self-contained (as it were), and sufficient evidence for themselves, are really, as a little consideration will show, dependent for their validity on some such proposition as this—"all that is coherent is true". Which is itself again either ultimate or derivative.

This double function is an important characteristic of a complete philosophy; let me now mention another which, though it would seem sufficiently obvious, is continually ignored. It may be stated thus: "The business of philosophy is to deal with the grounds, not the causes of belief".

There is no distinction which has to be kept more steadily in view than this between the causes or antecedents which produce a belief, and the grounds or reasons which justify one. The inquiry into the first is psychological, the inquiry into the second is philosophical, and they belong therefore (according to the classification just announced), to entirely distinct departments of knowledge.

No doubt, in constructing a philosophy, a previous psychological inquiry may be required. It may be necessary to acquaint ourselves with the various modes by which we arrive at conviction, before we can select those which are legitimate. But what we must not do, and what we are very apt to do, is to suppose that by performing the first operation satisfactorily, we absolve ourselves from performing the second at all. In the face of modern discovery we have continually to recollect that no progress made in tracing the history of opinions, no development of the theory of association of ideas, no application of the doctrine of evolution to mind, however much they may prepare the ground for a philosophy, add, or can add, one fragment to its structure.

Thus, it is never a final answer to philosophy to say of a particular belief, it is "innate," "connate," "empirical," or "*à priori*," the result of inheritance, or the product of the association of ideas. Psychology is satisfied by such replies, but to make psychology the rational foundation for philosophy is to make a department of science support that on which all science is by definition supposed to rest. It is strictly impossible that any solution of the question "How came I to believe this?" should completely satisfy the demand "Why ought I to believe it?" though, especially in the case of derivative beliefs, it may go some way towards it. In the case of what profess to be ultimate beliefs, discussions as to their origin are either philosophically irrelevant, or else prove to demonstration that they are not ultimate. This will perhaps be clearer if we take a concrete case. Let us suppose that the result of a particular psychological investigation is that a certain judgment, *e.g.*, "Everything has a cause," is "*à priori*". The psychologist who makes this discovery is apt to trespass on the domain of philosophy, and add "it is therefore true". Now if "everything has a cause" is to be accepted as true, because it is "*à priori*," then for that very reason it is not ultimate; two propositions at least must be accepted before it: 1st, all "*à priori*," judgments are true, and 2nd, this is an "*à priori*" judgment. Both of which are assertions both disputable and disputed. So in loose philosophical discussion it is very common to advance some principle as being self-evident, neither requiring nor possessing any justification, and immediately afterwards to adduce in its support some such argument as that "it is common to all men," or that "it has been implanted in our nature by a benevolent and all-wise Creator". In such cases it is clear either that the principles in question are not self-evident, or that the arguments used to support them are superfluous.

It is by the consideration of such fallacies as these that I have been induced to use the word "ultimate," when the expression "*à priori*" might appear the most natural. "*A priori*" means independent of experience, but "independent of experience" is ambiguous. It may mean either that experience has not produced the judgment in question, or that it furnishes no grounds for believing it. The first meaning is quite beside the purpose; philosophy has no direct concern with the origin of beliefs, which, as before stated, is part of the subject-matter of psychology. The second meaning, on the other hand, while it excludes experience as a ground of belief, and so far expresses the desired idea, does not express the full differentia of ultimate beliefs, *viz.*, that *there are no grounds for believing them at all.* On the contrary, it sometimes seems to suggest itself directly as a reason for accepting a judgment (as if the fact that experience did not prove anything was a ground for believing it), and sometimes mediately, as showing that the constitution of our mind when in a healthy condition impels us to believe it or that it was implanted in us by the Author of our being; which reasons, whether good or bad, show by the very fact that they are given as reasons, that the judgment called "*à priori*" is not ultimate.

While, then, it is evidently not the business of philosophy to account for ultimate axioms and modes of inference, it is also clear (though it may be hardly necessary to make the remark) that it is not its business to *prove* them. To prove any conclusion is to show that it legitimately follows from a true premiss; so that if we were obliged to perform this operation for our axioms and modes of inference before they were to be received as ultimate, we should be driven either to argue in a circle or to an infinite regress. Indeed, this will sufficiently appear if we reflect that all we mean by ultimate is "independent of proof".

But if philosophy is neither to investigate the causes nor to prove the grounds of belief, what, it may be asked, is it to do? Its business, as I apprehend it, is to disengage them, to distinguish them from what simulates to be ultimate, and to exhibit them in systematic order.

What is meant here by disengaging the grounds of belief in contradistinction to proving them, will appear more clearly if we consider what is done by deductive logic. Deductive logic, apart from the practical rules with which it is encumbered, is (according to the terminology here employed) neither an art nor a science, but a systematic account of an ultimate mode of inference by which it may be distinguished from all other modes, whether legitimate or illegitimate, whether ultimate or derivative: it is therefore by definition a branch of philosophy.

Now when deductive logic says that any three propositions which can be reduced to the form "All A is B, all C is A; all C is B," are legitimately connected as premisses and conclusion, whatever may be their content, it is by no means intended that such pieces of reasoning derive their validity from the fact of their corresponding with the formula. What is meant is simply to distinguish and mark off a certain mode of inference by giving a general description of it; each particular example of such inference being in itself the witness of its own validity.

This example explains the procedure of philosophy with regard to *inferences:* the axioms of mathematics furnish an illustration of its procedure in the matter of ultimate *principles.* "240 pence and 20 shillings being each equal to a pound, are equal to one another," is one of an indefinite number of similar self-evident propositions, which are described by saying that "things which are equal to the same thing are equal to one another"; but which do not require to be deduced from such general description in order to make them certain. Such a deduction is, no doubt, possible. I may, if I please, say: "Things which are equal, &c."; "240 pence and 20 shillings are things which are equal, &c."; "therefore they are equal to each other". But such a syllogism would be as frivolous as Mill supposes all syllogisms to be; and for this reason, *viz.,* that the conclusion is quite as obvious and certain as the premiss which is introduced to prove it.

It is conceivable, of course, that the axioms at the basis of knowledge are incapable of classification; that no two of them have anything in common except the fact that they are ultimate. In such an event the business of philosophy will be to enumerate, instead of describing them. But this can hardly be the case with modes of inference. The philosophy of deduction is already comparatively speaking, complete; and though the same cannot be said of any other mode of inference, it is difficult to believe that the bond connecting premisses and conclusion differs in every case, so as to exclude the possibility of classification. Something very distantly approaching this state of things would exist if each department of knowledge had a mode of reasoning peculiar to itself, as some have supposed *(e.g.)* theology to have.

To classify inferences is to exhibit what is called their common form. And it is plain that if of two inferences, which by classification have the same form, one is false and the other true, the classification which connects them is philosophically worthless. There would be no use in deductive logic, for instance, if some syllogisms in "Barbara" were trustworthy and others not.

It follows from this very obvious remark that every kind of logic if it is to be philosophical must be formal. The whole object of a philosophy of inference being to distinguish valid and ultimate inferences from those which are invalid or derivative, this can only be done either by exhibiting the common form or forms of such inferences, or (on the violent hypothesis that they have no common forms) by enumerating every concrete instance. To enunciate a form of inference which shall include both valid and invalid examples, can at best only have a psychological interest; philosophically, it is misleading.

The same remark applies *mutatis mutandis* to any classification of ultimate propositions.

There is no ground "*à priori*" (*i.e.*, following from the idea of a philosophy) for supposing that ultimate judgments are general, rather than particular. Of course if they are the latter, there must be some legitimate mode of reasoning from particulars without the help of general propositions.

Neither would I venture to assert that they must be *certain.* To say that our ultimate grounds of belief may be merely probable, will appear a paradox to some, and a truism to others. To me it seems to express a bare possibility. For there are these three remarks to be made on it:—1st. That the desire of certainty being the very thing which impels us to seek a philosophy, mere probability can never thoroughly satisfy our inquiries. 2nd. That, as a matter of fact, it will be found, I think, that no merely probable judgment is ever regarded as ultimate; nobody says of any judgment—"There are no grounds whatever for believing this, indeed none are required, *but I think it probable*". 3rd. That since, according to received doctrines, which for the moment I assume to be true, the probability of any conclusion diminishes rapidly with the number of probable premisses required to prove it, if *many* of our ultimate premisses are merely probable, anything remotely approaching certainty for ordinary knowledge will be out of the question. So that those who aspire to regulate their convictions according to reason, will have to modify considerably their ordinary attitude towards current doctrines.

II.

Before proceeding to extend and apply these remarks on the idea of a Philosophy in general to the philosophy of Ethics in particular, it is necessary to correct an error which, in these days, when science and the knowable are supposed to be co-extensive, is natural though not the less mischievous:—the error I mean by which Ethics is degraded to a mere section or department of Science. At first sight, and from some points of view, the opinion seems plausible enough. That mankind have passed through many ethical phases (for example) is a fact in history, and history belongs to science: that I hold certain moral laws to be binding is a fact of my mental being; and, like all other such facts, is dealt with by Psychology—also a branch of science. Physiology, Ethnology, and other sciences, all have something to say concerning the origin and development of moral ideas in the individual and in the race; it is not unnatural, therefore, that some men of science, impressed by these facts, have claimed, or seemed to claim, Ethics for their own.

To hold such a view would be a most unfortunate error; not to hold clearly and definitely its contrary may lead to much confusion. For though, as will appear, scientific laws form necessary steps in the deduction of subordinate ethical laws, and though the two provinces of knowledge cannot with advantage be separated in practice, still the truth remains that scientific judgments and ethical judgments deal with essentially different subject-matters.

Every scientific proposition asserts either the nature of the relation of space or time between phenomena which have existed, do exist, or will exist; or defines the relations of space or time which would exist if certain changes and simplifications were made in the phenomena (as in ideal geometry), or in the law governing the phenomena (as in ideal physics). Roughly speaking, it may be said to state facts or events, real or hypothetical.

An ethical proposition, on the other hand, though, like every other proposition, it states a relation, does not state a relation of space or time. "I ought to speak the truth," for instance, does not imply that I have spoken, do speak, or shall speak the truth; it asserts no bond of causation between subject and predicate, nor any co-existence nor any sequence. It does not announce an event; and if some people would say that it stated a fact, it is not certainly a fact either of the "external" or of the "internal" world.

One cause, perhaps, of the constant confusion between Ethics and Science is the tendency there appears to be to regard the psychology of the individual holding the moral law as the subject-matter of ethics, rather than the moral law itself; to define the position which the belief in such a proposition as "I ought to speak the truth" holds in the history of the race and of the individual, its cause and its accompaniments, rather than its truth or its evidence; to substitute, in short, psychology or anthropology for ethics. The danger of such confusion will partly be shown by the few remarks which follow on the "Idea of a Philosophy of Ethics":—that is, on the *form which any satisfactory system of Ethics must assume, or be able to assume, whatever be its contents.*

The obvious truth that all knowledge is either certain in itself, or is derived by legitimate methods from that which is so, was sufficiently dwelt on before; and this, which is true of knowledge in general, is of course also true of ethical knowledge in particular. A little consideration will enable us to go on, and state this further fact, which is peculiar to ethics: *The general propositions which really lie at the root of any ethical system must themselves be ethical, and can never be either scientific or ontological.* In other words, if a proposition announcing obligation require proof at all, one term of that proof must always be a proposition announcing obligation, which itself requires no proof. This truth must not be confounded with that which I have just dwelt upon, namely, that Science and Ethics have essentially different subject-matters. This might be so, and yet Ethics might be indebted for all its first principles to Science.

A concrete case will make this second statement clearer. A man (let us say) is not satisfied that he ought to speak the truth. He demands a reason, and is told that truth-telling conduces to the welfare of society. He accepts this ground, and apparently, therefore, rests his ethics on what is a purely scientific assertion. But this is not in reality the fact. There is a suppressed premiss required to justify his conclusion, which would run somewhat in this way—"I ought to do that which conduces to the welfare of society". And this proposition, of course, is ethical. This example is not merely an illustration, it is a typical case. There is no artifice by which an ethical statement can be evolved from a scientific or metaphysical proposition, or any combination of such; and whenever the reverse appears to be the case, it will always be found that the assertion, which seems to be the basis of the ethical superstructure, is in reality merely the minor of a syllogism, of which the major is the desired ethical axiom.

If this principle be as true as it seems to me to be obvious, at one blow it alters our attitude towards a vast mass of controversy which has encumbered the progress of moral philosophy. So far as the proof of a basis of morals is concerned, it makes irrelevant all discussion on the origin of moral ideas, or on the nature of moral sentiments; and it relegates to their proper sphere in psychology or anthropology all discussion on such subjects as association of ideas, inherited instincts, and evolution, in so far, at least, as these are supposed to refer to *ultimate* moral laws. For it is an obvious corollary from our principle, that the origin of an ultimate ethical belief never can affect its validity; since the origin of this belief, as of any other mental phenomenon, is a matter to be dealt with by Science; and my thesis is, that (negatively speaking) scientific truth alone cannot serve as a foundation for a moral system; or (to put it positively), if we have a moral system at all, there must be contained in it, explicitly or implicitly, at least one ethical proposition, of which no proof can be given or required.

In one sense, therefore, all Ethics is "*à priori*". It is not, and never can be, founded on experience. Whether we be Utilitarians, or Egoists, or Intuitionists, by whatever name we call ourselves, the rational basis of our system must be something other than an experience or a series of experiences; for such always belong to science.

Limited indeed is the number of English moralists who have invariably kept this in view. However foreign it may be to their various systems, an inquiry into the origin or into the universality of moral ideas always appears to slip in, not in its proper place, as an interesting psychological adjunct, but as having an important bearing on the authority of their particular principle. And the necessary result, of course, of these efforts to support ultimate principles is, that they cease to be ultimate, and become not only subordinate, but subordinate to judgments which, if explicitly stated, would very likely appear far less obvious than they.

There is a whole school of moralists, for example, who find or invent a special faculty, intellectual or sensitive, by which moral truth is arrived at; who would regard it as a serious blow to morality if the process by which ethical beliefs were produced was found to be common to many other regions of thought. Oddly enough, these are the very people whose systems are often called "*à priori*". Now if by this term be meant that the ordinary maxims of morality are (according to these systems) independent of experience, it is appropriate enough; but if it be meant that they are self-evident, it is a singular misnomer. For it is clear that on their systems rigidly interpreted those maxims derive their evidence, not from their own internal authority, but from the fact that they bear a certain special relation to our mental constitution; so that the ethical proposition which really lies at the root of their ethics is something of this sort:—"We ought to obey all laws the validity of which is recognised by a special innate faculty, whether called conscience or otherwise." Now, I do not deny that from a philosophical point of view such propositions as these are possible foundations of morals; but what I desire to point out is that such a phrase (to take a concrete case) as "I ought to speak the truth because conscience commands it" may have two widely different meanings, and may belong to two different systems of ethics, not commonly distinguished. According to the first and most accurate meaning, "I ought to speak the truth" is an inference, of which the major premiss must be, "I ought to do what conscience commands," and being an inference, cannot obviously be an *à priori* law. According to the second and inaccurate meaning, "I ought to speak the truth" is in reality received on its own merits, and conscience is very unnecessarily brought in, either to add dignity to the law or to account for its general acceptance among mankind, or for some other extra-ethical reason. The first of these views is open to no criticism from the point of view of ethical philosophy; so far as form is concerned it is unassailable. But I greatly suspect that most people who nominally found their morality on conscience really hold the second theory; and in that case, as I think, their statement is misleading, if not erroneous.

So far I have only given a negative description of the nature of an ethical proposition. I have said, indeed, that it announces obligation, but this statement is tautological; for if we knew in what obligation consisted, there would be no difficulty in stating the meaning of *ethical.* Beyond this I have only said that an ethical judgment deals with an essentially different subject-matter from either science or metaphysics. Is it possible to say more than this? Is it possible to give any description of ethical propositions which shall add to our knowledge of their character? On general grounds it is plain that this can only be done, supposing that what are *commonly* called ethical propositions form part of a larger class of judgments which resemble them in being neither scientific nor metaphysical, but differ from them in some other respect. This follows from the very nature of description. I myself hold this to be the case. I hold not only that the judgments commonly called ethical (but which, in spite of the clumsiness attendant on changing the meaning of a term in the middle of an essay, I shall henceforward call *moral*), have the two negative characteristics above mentioned in common with a larger class of judgments; but that the distinction between the two classes should be ignored by ethical philosophy, since it depends not on "form" but on "matter". All judgments belonging to either of these classes I shall henceforth call "ethical". Those commonly called ethical I shall describe as "moral"; the rest are either "non-moral" or "immoral". Every possible judgment, then, is either ethical or non-ethical; and every ethical judgment is either moral or non-moral or immoral. The terminology thus being defined, let me explain it, and at the same time my view on the subject.

If a man contemplates any action as one which he chooses to perform, he must do so either because he regards the action as one which he chooses for itself, or because he expects to obtain by it some object which he chooses for itself. And similarly, if he contemplates any object as one he chooses to obtain, he must do so either because he regards that object as chosen for itself, or because it may be a means to one that is. In other words, deliberate action is always directed mediately or immediately to something which is chosen for itself alone; which something may either be itself an action, or what I loosely term an object. Including both, then, under the term "end," I define an ethical proposition thus:—*An ethical proposition is one which prescribes an action with reference to an end.* Nobody will deny that this definition is true of all moral propositions (most people, indeed, will think that it is too obvious to need stating); but they will probably say, and say truly, that it is also true of a great many propositions which are not usually called moral. Now my object is to show that the distinction between what are usually called moral propositions and that larger class which I have defined above, has no philosophic import—has nothing, that is, to do with the grounds of obligation. And for this purpose let me analyse more carefully this larger class (which I have called ethical) from a philosophic point of view, that is, with reference to the rational foundation and connection of its parts.

(1) Every proposition prescribing an action with reference to an end, belongs either explicitly or implicitly to a system of such propositions. (2) The fundamental proposition of every such system states an end, which the person who receives that system regards as final—as chosen for itself alone. (3) The subordinate propositions of that system are deduced from the fundamental proposition by means of scientific or theological minor premisses. (4) When two such systems conflict, their rival claims can be decided only by a judgment or proposition not contained in either of them; which shall assert which of these respective fundamental "ends" shall have precedence. [Ethics, then, rests on two sorts of judgments, neither of which can be deduced from the other, and of neither of which can any proof be given or required. The first sort declares an end to be final, the second declares which of two final ends is to be preferred, if they are incompatible. This second sort, of course, is not essential to an ethical system, but can only be required when an individual regards more than one end as final.] (5) No other sort of proposition can possibly lie at the root of an ethical system. [This is merely a re-statement of the law dwelt on before.]

Now, in so far as this is a complete philosophical diagram of every ethical system, it must show the sort of authority on which every ethical proposition, every imperative, must rest. Yet since it is plain that this diagram takes no account of the differences there may be between moral and immoral ethical systems, how, it may be asked, can we explain the wide-spread delusion that these differences affect the authority of the former? This question takes us far afield into the regions of Psychology and Anthropology, but the answer to it may perhaps be suggested as follows. The main reason for this error appears to be false analogy, unchecked by any clear apprehension of the nature of the rational or philosophical peculiarities of an ethical system. And in order to illustrate this and at the same time to place the theory I am defending under as strong a light as possible, it may be as well to examine the exact bearing which Universality and the approval of Conscience (two of the chief characteristics of moral as opposed to non-moral or immoral systems) are supposed to have on obligation.

My position, of course, is that they have *no* bearing; and in order to show this I offer the following analysis to the reader—taking Universality first. A law may be said to be universal in one of four senses. It may mean, first, that all intelligences regard themselves as bound by it. This meaning we need not further consider, not only because it is a scientific assertion, and therefore, as I have shown, incapable of becoming the foundation of an ethical system, but also because it is a scientific assertion now entirely discredited. It is quite out of fashion to maintain that morality is the same in every race and every country, and therefore till, in the revolutions of thought, some one is found to re-assert this doctrine, we need not further discuss it.

The second possible meaning is that by a universal moral law we mean one by which all intelligences *ought* to regard themselves as bound. This also we may dismiss because it amounts to saying that there is a moral law which obliges all intelligences to be bound by other moral laws. Is then *that* moral law universal *in the sense we are discussing?* If it is, we are committed to an infinite series of moral laws, each commanding us to be bound by the preceding one. If it is not, then there can be a moral law which (in this sense) is not universal.

The next meaning which we can attach to the word universal is this—that by a universal moral law we mean one which *we* think all men ought to obey. That we do think this of most moral laws, and that we do not think it of the other ethical laws, namely the non-moral and the immoral ones, is tolerably certain. It remains to inquire whether the difference bears on obligation; and this inquiry, as it seems to me, may be settled by a very simple consideration. All intelligences means Me and all other intelligences. The first of these constituent parts would be bound by a law held by Me whether it were universal (in this sense) or not. The second would *not* be bound by a law held by Me whether it were universal in this sense or not. In other words, to be bound by a moral law (and this, by the way, brings out very clearly the difference between being ethically bound and legally bound) is exactly the same thing as to regard it as binding on you; it is not to regard it as binding on some one else, and it is not for some one else to regard it as binding on you; it has therefore, and it can have, no connection with Universality in this third sense.

It is, of course, open to any one to assert that he recognises no imperative which is not universal (in this sense). This may very well be the fact, and I have no wish to deny it. What I deny is that the connection of the two is other than empirical and accidental, or that it has any place in the philosophy of obligation.

The fourth and last meaning which I am able to attach to the word universal when used of a law, is that it signifies that all people of "well-constituted minds" do as a matter of fact regard themselves as bound by a law so qualified. Now, if "well-constituted" is defined with reference to morality, and means "holding the one true moral system," a proposition that all true or right moral laws are universal is frivolous and merely verbal. If it be defined with reference to something else—if it means, for instance, sane, or well-educated, or Christian, or scientific, or anything non-moral, then the same arguments may be used to show that universality in this sense cannot be a ground of obligation as I used when speaking of the first sense. For a proposition asserting that any considerable body of men, distinguished fromthe rest of mankind by some non-moral attribute, hold the same moral code, is very likely to be questionable, and being a scientific assertion, is quite certain to be irrelevant.

As regards Conscience, I have shown before, that to assume a special faculty which is to announce ultimate moral laws can add nothing to their validity, nor will it do so the more if we suppose its authority supported by such sanctions as remorse or self-approval. Conscience regarded in this way is not ethically to be distinguished from any external authority, as, for instance, the Deity, or the laws of the land. Now, it is plain that no external authority can give validity to ultimate moral laws, for the question immediately arises, why should we obey that authority? Only two reasons can be given. The first is that it is *right in itself* to obey; the second is that (through a proper use of sanctions) it will be *for our happiness* to obey. Now, the first of these reasons is a moral law, which obviously does *not* derive its validity from the external authority, because the external authority is an authority only by means of it. And the same may be said of the second reason, substituting the words "ethical but non-moral" for the word "moral". In neither case, then, is the external authority the ultimate ground of obligation.

The inevitable ambiguity which arises from the sudden extension of the meaning of the word "ethical" to imperatives which are immoral or non-moral, makes it, perhaps, desirable that I should very concisely re-state from another point of view the main position I have been attempting to establish.

All imperatives, all propositions prescribing actions, have this in common:—That if they are to have any cogency, or are to be anything but empty sound, the actions they prescribe must be to the individual by whom they are regarded as binding, either mediately or immediately desirable. They must conduce, directly or indirectly, to something which he regards as of worth for itself alone. The number of things which are thus in themselves desirable or of worth to somebody or other is, of course, very great. Pleasure or happiness in the abstract, other people's pleasure or happiness, money (irrespective of its power of giving pleasure), power, the love of God, revenge, are some of the commonest of them, and every one of them is regarded by some people as an end to be attained for its own sake, and not as a means to something else. Now, it is evident that to every one of the ultimate propositions prescribing these ends, and for which, as the ends are ends-in-themselves, no further reason can be given, there will belong a system of dependent propositions, the reasons for which are that the actions they prescribe conduce to the ultimate end or end-in-itself.

If, for instance, revenge against a particular individual is for me an end-in-itself, a proposition which prescribes shooting him from behind a hedge may be one of the subordinate or dependent propositions belonging to that particular system. But whereas the indefinite number of such systems is thus characterised by a common form, it is divided by ordinary usage into three classes, the moral, the non-moral, and the immoral, about the *de*notation of which there is a tolerable agreement. It would be universally admitted, for instance, that a system founded on the happiness of others was a moral system, while one founded on revenge was immoral: and, though there would be more dispute as to the members of the non-moral class, this is not a question on which I need detain the reader. The denotation then of these names being presumably fixed, what is the connotation? or to simplify the inquiry, what is the connotation of a *moral* system? The apparent answers are as numerous as the number of schools of moralists. But however numerous they may be, they can all be divided into two classes. The first class merely re-state the denotation, in other words, announce the ultimate end-in-itself of the system, and so, properly speaking, give no answer at all.

A Utilitarian, for example, may simply assert that the greatest happiness of the greatest number is for him the ultimate end of action. If he stops there he evidently shows no philosophic reason for distinguishing the system he adopts from the countless others which exist, or have existed. If he attempts to give any further characteristic of his system, he then belongs to the second class, who do indeed explain the connotation of the word moral according to their usage of it, but whose explanations have, and can have nothing to do with the grounds of action or the theory of obligation. The sanction of conscience, emotion of approval, expectation of reward, feeling of good desert, glow of conscious merit—these are all most undoubtedly marks or characteristics of moral actions; how they came to be so, whether by education, association of ideas, innate tendency, or howsoever it has happened, matters nothing whatever except to the psychologist; that they are so is certain, but the significance of the fact is habitually misunderstood. Are they simply the *causes* of good action? Then they have nothing to do with Ethics, which is concerned not with the causes but with the grounds or reasons for action, and would remain wholly unchanged if not a single man ever had done or could do right. Are they the *ends* of action? Is the fact that they are obtained by a certain course a valid reason for pursuing that course? In that case they stand to the person holding that opinion in precisely the same relation as money does to the miser, or revenge to the savage. They are the groundwork of an ethical system, and to state them is simply to denote *what* ethical system it is which is being alluded to. Are they, finally, not ends of action, but merely marks by which certain actions may be known to belong to a particular system? In that case, and for that very reason, they can have nothing to do with the grounds or theory of obligation. Therefore, finally, though under the general name "ethical" are included not only moral, but also non-moral and immoral systems, the distinction regarded from the outside between these sub-divisions is not essential, and has no philosophic import—which was the thing to be proved.

III.

Before concluding these remarks, I would point out three corollaries that may be drawn from them, which are not without interest. The first corollary is—that no instructive analogy exists between Ethics and Æsthetics. It is true, no doubt, that philosophers have talked about the Good and the Beautiful, as if they were co-ordinate subjects of investigation, and that in ordinary language we say both that a picture "ought" to be admired, and that an action "ought" to be performed. Nevertheless, reflecting on actual or possible æsthetic systems, it would seem clear that they must be included under one of four heads. They must belong either (1) to Ethics, or (2) to Psychology, or (3) to Ontology, or, lastly (4), to Ontology with an ethical or psychological element superadded. And in none of these cases can Æsthetics be said to rank as a parallel subject of inquiry with Ethics.

The first of these possibilities, namely, that Æsthetics belongs to, or is included in Ethics, I mention chiefly for the sake of completeness. Even those art-critics whose denunciations of bad taste approach most nearly to the level of moral reprobation, hardly maintain that it is our *duty* to admire the Venus of Milo in the same sense as it is our *duty* to love our neighbour. If any do hold this view, the conclusion to be drawn is, not that their æsthetic code stands on a different, but similar, platform to their ethical code, but that their ethical code is larger than that of ordinary people, by the whole amount of their Æsthetics.

According to the second of these possibilities (namely that Æsthetics belongs to Psychology) Æsthetics is merely the investigation of the nature and causes of peculiar emotions—chiefly secondary—produced in us by certain external causes, objects, or representations, and has no more to do with Ethics, either by way of resemblance or contrast, than any other department of Psychology.

The third possibility, namely, that Æsthetics belongs to Ontology, includes all such theories of the Beautiful as deal exclusively with "objective standards," "ideas," or "archetypes," "the evolution of the Idea," or "the perception of the agreement of the Subject and Object," and such-like. Taken by themselves, these theories belong to Ontology; but if there be added any consideration of the relation these ontological entities or processes bear to the individual, these considerations must belong either to the first or the second of the above-mentioned possible treatments of Æsthetics, and must, therefore, be either ethical or psychological. This is the fourth possibility.

From this concise analysis, then, it would seem clear that no analogy exists between Ethics rightly understood and any system right or wrong of Æsthetics. But if that be so, how comes the existence of any analogy even to have been supposed? The reply to this is, that there does exist an analogy between some theories of Æsthetics and Ethics *wrongly* understood. Some moralists, for example, have dwelt largely on the emotion excited in us by virtuous actions. And if the scientific examination of these emotions really constitute the essence of Ethics, there is unquestionably an analogy between theories of the Good and some theories of the Beautiful.

Again, if ethical inquiries are thought to resolve themselves into researches concerning the existence and nature of some objective standard of right, it is inevitable that they should suggest, and it is probable they would resemble, those other ontological inquiries concerning the objective standard of beauty. Now it must not be supposed that I pronounce either of these investigations irrational: all I contend for is that they are not ethical; or, rather (to avoid a dispute about words), what I contend for is, that they have nothing, and can have nothing, directly to do with Obligation.

The second corollary concerns the functions of the Moral Philosopher. It is clear from what precedes, that it is *not* the business of the moral philosopher to account for the origin of moral ideas, or to analyse and explain that growth of sentiment which collects around the time-honoured maxims of current morality. These are topics which belong to Psychology. Neither is he expected to prove the propositions which lie at the root of any system of morals; for these are incapable of proof. Nor, for the same reason, can he justify the judgments which declare which of two final ends is to be preferred in case of conflict, or how much of one is to be preferred to how much of the other. Nor, in reality, has he any but a subordinate part to play in expounding or deducing the derivative rules of morality; and this for the following reason.

The deduction of any derivative rule is always necessarily in this form: "The happiness of mankind ought to be promoted" (this, let us say, is the ultimate unprovable foundation of the system); "monogamy promotes the happiness of mankind" (this is the scientific—in another system it might have been theological—minor premiss); "therefore monogamy is a system which ought to be supported". This is the required derivative rule. Now the only difficulty in deducing this conclusion from the first principle of the system lies in the difficulty of demonstrating the minor premiss; in other words, it lies in the difficulty of a certain sociological investigation, which the speculative moralist as such cannot be expected to undertake.

The important duties of the moralist, for he has important duties, arise from the confused state in which the greater part of mankind are with regard to their ethical first principles. The two questions each man has to ask himself are:—What do I hold to be ultimate ends of action? and,—If there is more than one such end, how do I estimate them in case of conflict? These two questions, it will be observed, are questions of fact, not of law, and the duty of the moralist is to help his readers to discover the fact, not to force his own view down their throat by attempting a proof of that which is essentially, and by its very nature, incapable of proof. Above all, he must beware of substituting some rude simplification for (what may perhaps be) the complexity of nature, by deducing (as the Utilitarians do) all subordinate rules from one fundamental principle, when, it may be, this principle only approximately contains actual existing ethical facts.

Since these two questions can be answered, not by ratiocination, but only by simple inspection, the art of the moralist will consist in placing before the inquirer various problems in Ethics free from the misleading particulars which surround them in practice. In other words, his method will be casuistical, and not dogmatic.

It may perhaps seem strange that, after commenting at some length on the prevailing confusion between Ethics and Psychology, I should now have to announce that the business of the Ethical Philosopher (at least, so far as first principles are concerned) is as purely psychological as, according to the two preceding paragraphs, I make it out to be; and it may seem, therefore, as if the difference between my view and that of the philosophers whom I have attempted to criticise is by no means essential or important. This, however, is not the case. My complaint against these philosophers is that they appear to suppose that a psychological law can serve as a rational basis for an ethical system; so that their chief aim often seems to have been the establishment of their own particular views on the origin and nature of our moral sentiments. I, on the other hand, altogether deny the possibility of such a basis, and maintain that all that a moralist can do with regard to ethical first principles is, not to prove them or deduce them, but to render them explicit if they are implicit, clear if they are obscure. To do this effectually he must, of course, treat of ideas and notions, and his work will therefore, in some sense, be undoubtedly psychological. To make this statement complete, I should add that (as appears by my next paragraph) there is no absurdity in supposing that a moralist may in the course of his speculations hit on some entirely new first principle which he has not held even obscurely before, but which commends itself to his mind as soon as it is presented to him.

The third corollary I draw is this—that there are only two senses in which we can rationally talk of a moral system being superior to the one we profess. According to the first sense, superior means superior in *form*, more nearly in accordance with the ideal of an ethical system just sketched out. According to the second sense, in which the superiority attaches to the *matter* of the system, it can only mean that the system is one of which we are ignorant, *but which we should adopt if presented to us.* It is a hypothetical superiority.

Now it must be observed that the sense in which we speak of other hypothetical systems as being superior to our own, is by no means identical with that in which we speak of our own as being superior to that of other people. Looking back over history we perceive a change and development of the moral ideas of the race in the direction of the systems which now pervail; and this change we rightly term an improvement. But if, arguing from the past, we suppose that this improvement will continue through the indefinite future, we are misled by a false analogy. The change may very well continue; the improvement certainly will not. And the reason is clear. What we mean, or ought to mean, by an improvement in the past is an approach to our own standard, and since any change at all corresponding in magnitude to this in the future must involve a departure from that standard, it must necessarily be a change for the worse.

In other words, when we speak of another system as being superior (in matter) to our own, we speak of a possible system which we should accept if we knew it. When we speak of our own system being superior to that of some other person, we assert the superiority unconditionally, and quite irrespectively of the possible acceptance of it by that other person, supposing him to be acquainted with it. If then we believe that development will proceed in the future as it has done in the past, we must suppose that a time will come when the moral ideas of the world will be as much out of our reach, supposing them presented to us, as ours would be out of reach of primitive man. This is also true of scientific ideas: but there is this difference between them, that whereas the change in scientific ideas may be an improvement, that in moral ideas must be a degradation. The grounds of this distinction, of course, are obvious; *viz.*, that the standard of excellence in the case of scientific ideas is, or is supposed to be, conformity to an infinitely complex external world—a conformity which may increase with every change in the ideas. The standard of excellence, on the other hand, in moral ideas must necessarily be conformity to our actual ideal, and this conformity must diminish with every change in the ideas.

This point would not perhaps have been worth dwelling on, if it was not that the discussion brings into strong relief the nature, so far as form is concerned, of the criterion of Right, and has also some bearing on current theories of optimistic Evolution, with which I confess it does not seem possible easily to reconcile it.

ARTHUR JAMES BALFOUR.

VI.—PHILOSOPHY IN THE DUTCH UNIVERSITIES.

The history of Philosophy among the Dutch has never yet been written. It would have little to record beyond a long series of infiltrations of foreign thought into the science, theology and literature of the Northern Netherlands. Its one great name would be that of Spinoza; and him we can scarcely consider a fair representative of the native habit of thinking. In the average learned Dutchman there is much less of his speculative daring than of the sceptical conservatism of old Erasmus. Born of a race of thrifty citizens and husbandmen, he fully appreciates the value of accurate knowledge and sound scholarship, but pure theory he generally distrusts, as likely to unsettle the even balance of his mind, and endanger the peaceful progress of human affairs. As the late Professor van Heusde puts it: "in philosophising we ask for simplicity, good sound sense, and especially good principles, that should in no wise disagree with those of our religious doctrine". Hence philosophy is valued rather as a mental exercise to be taken with moderation than as a pursuit for life after fundamental truth. For the purpose in view a summary acquaintance with existing theories and their shortcomings is commonly thought sufficient, while strict consistency is given up as a hopeless pretension, and people on their own part acquiesce in some mild and tolerant variety of Protestantism.

On the other hand there is a steady demand for French, German, and English literary productions. And in the nation itself we find a considerable admixture of foreign elements from the most different parts, to which it is indebted for much more discrepancy of opinion than one might be inclined to look for in so small and so untroubled a community. Ultramontanism, Calvinism, and Positivism, Toryism and Radicalism, all have their steadfast adherents, and there can hardly be a party in the civilised world without its sympathisers in the present kingdom of the Netherlands. Nevertheless, as in England, while everybody is speaking his mind and it frequently comes to sharp altercations, this very continuance of verbal strife has proved conducive to independence of opinion and, in the main, to a prudent forbearance from extremes.

In the present slight sketch—which will be strictly confined to Dutch Academical Philosophy—it would take us too far to give an account of anything anterior to the Reformation. There were a few creditable schools, founded chiefly by Gerardus Magnus and his brotherhood since the fourteenth century, but the higher order of education, and all academical degrees, had to be sought for abroad. When the change of religion made Popish universities unavailable, William of Orange persuaded the Provincial States of Holland to provide for the establishment at Leyden of a complete set of Faculties, namely Theology, Law, Medicine and Arts. To the new university a charter was granted by the Prince Stadholder under the legal fiction of an order from the nominal sovereign, King Philip II. of Spain (1575). Ten years after this, the Frisian States, on their own authority, founded a similar institution at Franeker, and their example was followed in time by those of the town and country of Groningen (1614). Harderwijk on the Zuider-Zee had a college added to its old established grammar-school by the district authorities of the Veluwe (1600), and this was afterwards endowed with the privileges of a university by the States of Gelderland (1648). The old episcopal town of Utrecht, long desirous of the same advantages, succeeded in establishing a college of its own (1634), which received academical prerogatives from the Provincial States in 1636. About the same period (1630 and 1632) identical measures were adopted by the cities of Deventer (in Overijssel) and Amsterdam. In both those cases, however, the Athenæa or Illustrious Schools, as they were called, have never been empowered by the supreme authorities to confer degrees, until, by the University Law of 1876, one has been suppressed altogether, and the other promoted to the rank of a municipal university. Meanwhile, after various accidents, Harderwijk and Franeker had been finally abrogated in 1818 and 1843 respectively. Other Athenæa had existed for some time at Nimeguen, Dordrecht, Bois-le-Duc, Breda, and Middelburg.

As all these places of education depended on different sovereign powers, there was no perfect similarity in their laws and customs. The statutes of Leyden, framed by a far-sighted statesman like William the Silent, were the most liberal of all, enacting no religious or philosophical restrictions. At Franeker all the professors had to subscribe to the confessional symbols of the established Presbyterian Church, and Groningen at least did not abandon this point until 1801. Utrecht copied Groningen in one more respect. The statutes of both contain the following article: "*Philosophi ab Aristotelis philosophia non recedunto,* propugnatores absurdorum paradoxorum et inventores dogmatum novorum ab Aristotelica doctrina discrepantium non feruntor*". In practice we shall presently find public opinion more powerful than either the liberty allowed in some places or the prohibition enacted in others.

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*Utrecht added the clause "*neque publice neque privatim*". All the old academical statutes were superseded by the Royal Decree of 1815.

Unlike all other continental universities, those of the United Netherlands were always subjected to boards of Curators, men of rank and note, who often wielded the power of appointing and even discharging professors. They never belonged to the body of the university, but acted as delegates of the sovereign who provided for its wants.* By their prudence, and the resistance they offered to clerical dictation, they were of great service in preserving freedom and peace. Of course the Calvinist clergy, inspired by zealous refugees from France and Belgium, kept struggling for influence upon the teaching at least of their own Faculty, and more than once, when they got for a moment the upper hand in public affairs, they obtained some temporary advantage. Yet the town corporation of Leyden declared from the first, that they were not willing to admit the inquisition of Geneva while making war against that of Spain. And when the famous Synod of Dordrecht demanded an ecclesiastical Curator to look after the theological faculty, its resolution remained a dead letter, and the regular Curators prevented the local synod from meddling with academical government. But the interests of their position forbade their giving countenance to very small minorities; and Spinoza, perhaps, was not far wrong when in the *Tractatus Politicus* he wrote: "*Academiae, quae sumptibus reip. fundantur, non tam ad ingenia colenda quam ad eadem coercenda instituuntur*".

Of college life as in England and at Cologne or Louvain, there was no question except in the case of certain exhibitioners, nearly all destined for the Church. Each university had its *bursa* or *œconomia;* at Leyden the States' College subsisted from 1592 to 1810, the Collegium Gallo-Belgicum (for preachers in the French language) from 1606 to 1703. Even within these the "regenting or tutorial system" found no favour. The Principal (called *Regens*) and his vicegerent merely repeated with the alumni what they learnt from the Professors common to all; and other undergraduates found plenty of private teachers ready to help them on in the same way. On Wednesdays and Saturdays there were no public lectures, but men went to hear Extraordinary Professors and licensed Readers, and, under the superintendence of any official teacher, tried their own powers in disputation.

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* At Leyden, Franeker, Harderwijk, they were separate boards commissioned by the Provincial States and the Stadholder. At Groningen, where the sovereignty was divided between the town and the country district, each appointed its own half of the board. At Utrecht the civic authorities were themselves the Curators, who took care not to allow any academical jurisdiction, whereas at Leyden the burgomasters sat with the Curatorial board, and also in the Rector's tribunal. From 1815 the burgomaster (or mayor) of each university-town was *ex officio* one of the Curators, but the new Law contains no such stipulation. Of course under the present Constitution the board is in its turn subordinate to the Minister of the Interior, there being no separate department of Education. The idea of the office was evidently suggested by the *Conservatores privilegiorum* of older universities.

The oldest Leyden Faculty of Arts (or Philosophy as it was surnamed) consisted of six Ordinary Professors, for Logic, Physics, Mathematics, and the three learned languages. Ethics was commonly regarded with some suspicion on account of its heathenish tendency; and Metaphysics also because of the Humanists' and Protestants' natural aversion from mediaeval subtleties. Still both were admitted as extraordinary subjects from the first, and before the middle of the seventeenth century they had obtained their place in the regular curriculum. Everyone, especially the candidate for orders, was expected to begin his studies with Humanities and Philosophy, although a degree in Arts was by no means looked on as indispensable. Nor do we find the degree of Bachelor taken except in a very few instances.* To the title of *Artium Liberalium Magister* that of *Philosophiae Doctor* was superadded at a very early period, so as to put the graduates markedly on a level with the "Doctors" of the other Faculties; the celebrated Gerardus Vossius became the first A.L.M., Ph. D. of Leyden in 1598.

As might be presumed, the official philosophy was the mitigated Scholasticism adopted in the Protestant schools of the time. Of Ramism there is hardly a trace.† Jac. Arminius the divine and Rud. Snellius the mathematician, both Hollanders from Oudewater, who had taught the dialectic of Ramus in Switzerland and Germany, were called to other duties at Leyden. Two occupants of philosophical chairs, Corn. de Groot (Leyden 1575) and Henr. de Veno (Franeker 1602-13) are mentioned as inclined to Platonic doctrines, meaning apparently some form of modernising eclecticism. As far as I know, de Groot's successor Nic. van Dam (1575-79) was an Aristotelian, and so were three Belgian professors at the same place, Alex. de Ratlo (1578-87), Ant. Trutius (1582-93), and Adr. Damman (1586-88).‡ After these and the insignificant Westerhovius (1583-84) came a Frenchman the elder Pierre du Moulin (*Molinaeus*, 1593-98), afterwards a minister at Paris, and several Scotch Peripatetics: Jas. Ramsay (1588-93), John Makolo (MacCulloch? Reader in Logic 1597), John Murdison (1600-5), and Gilbert Jack of Aberdeen *(Jacchaeus,* 1603-28)* Some writers have supposed a connection between the Aristotelian and the Calvinist predominance of the period; but there is no indication of nonconformity in the philosophy of the Remonstrant (or Arminian) party. Petr. Bertius, Ger. Vossius, and Caspar Barlaeus clearly belong to the same school with those by whom they were superseded in their offices in 1619 (to please the friends of the Synod of Dordt), Frank Burgersdijk (d. 1635) and Dan. Mostert *(Sinapius).* At Franeker, Lollius Adama (1585-1609), Andr. Roorda (1611-21), probably Joach. Andreae (1613-20), and certainly Arn. Verhel (1618-64) taught in the same spirit. At Groningen the first philosophical appointment was that of another Scotchman, Geo. M'Dowell, a native of Maxton on the Tweed, who was called from St. Andrews at the age of twenty-four. From the professor's chair, which he occupied from 1614 to '27, he stepped into that of a presiding military judge, and in time rose to be Charles II.'s ambassador at the Hague (1650). Nor did his academical successors, Franc. Meyvart from Ghent (1620-40), Mart. Schoock from Utrecht (1640-65), and Jo. Bertling (1667-90), swerve from the received doctrine. Schoock was a partisan, soon to become a private adversary, of Gisbert Voet, the Utrecht pillar of orthodoxy, and enlarged in print upon an endless variety of subjects, from Papacy and Cartesianism down to butter, herrings, and beer. In the Deventer College the Peripatetic banner was firmly upheld by a learned and far-travelled Doctor of Paris, Gisbert van Isendoorn (1634-47), who taught for nine years more at Harderwijk in his native province (1648-1657), and then died in peace, after obtaining a Curatorial resolution against the Cartesian heresies.

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* At Bologna the Bachelor's degree was altogether unknown.

† Prof. Jo. Hachting of Franeker (1622-30), published a *Dialectica Petri Rami* in 1626. In mere grammar-schools the doctrine appears to have found more favour.

‡ Ratlo had been in England, and Damman is probably the same who was called to Scotland by Geo. Buchanan, and wrote to Lipsius from Leith, in 1590.

During this first period, before the irruption of really original thought, Aristotle was cherished mainly as a guarantee for *bona fide* logical studies, as opposed to the slipshod facility that the Ramist and similar schools were contented to impart. Even so accomplished a classical scholar as Hugo Grotius was not to be deceived as to the mediocrity of the boasted disciples of Cicero, but recommended Murdison for the long vacant chair of Logic, and urged Jack to write his *Instt. Primae Philosophiae* (1616); while all the Peripatetic text-books of the time are adorned with laudatory verse by such men as Dan. Heinsius,

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* On the Scotch Philosophers in the Dutch Universities I shall be happy to exchange notes with their learned countrymen. Of Eglesham or Eglisemmus, mentioned by Prof. Veitch in No. V. of MIND as a Professor at Leyden, I have not been able to find a trace in any part of the country.

Ger. Vossius, Pet. Cunaeus, and Casp. Barlaeus, whom no one will suspect of a tender regard for the Middle Ages. Of those books one at least will be known by name to most readers of philosophical history. The Grammar Schools of that time retained not only the name of *scholae triviales*, but actually taught the old *trivium*: Grammar, Dialectic, and Rhetoric. Their work was found insufficient at the University; so the Provincial States directed the schools of Holland to be provided with standard treatises, and by their order Vossius wrote his *Grammatica* and *Rhetorica*, and Burgersdijk his *Institutiones Logicae* (Lugd. Bat. 1626), good scholarly works, that made their way all over Europe.

The old school having thus prepared everything for undisturbed dominion, was very soon after to be involved in a struggle for life with an enemy from quite a unexpected quarter. On April 16, 1629, the Rector of Franeker registered the name of *Renatus des Cartes, Gallus, Philosophus.* Not finding, as it seems, the scientific intercourse that he wished for, that habitual traveller soon returned to Amsterdam, whence he made only a short trip to England. At Amsterdam he made the acquaintance of the private tutor of some young men, Henri Reniers (or Renery as he writes the name), a Belgian convert from Romanism and then recently disappointed of a Leyden professorship. This new friend was called to a chair at Deventer in 1631, and in 1634 to one at Utrecht, where he died after a short time from sheer hard work. In both places he explained the tenets of his French master, cautiously but devotedly; as he wrote to Mersenne: "*is est mea lux, meus sol, erit ille mihi semper Deus*". At his death in 1639, not only his philological colleague and countryman Aemilius, but several of the magistrates and of the students held with him, and one of his pupils, Henr. de Roy (or le Roy, *Regius*), was teaching physiology on his principles with great applause. However, Regius in his medical chair thought fit to attack the Aristotelian school in such a style as to move the wrath, not only of his philosophical colleagues, Arn. Senguerd (1639-48) and Dan. Berckringer (1640-67), but of their mighty theological protector Gisbert Voet, himself an old pupil of Jack and private teacher of Burgersdijk. This indefatigable champion of things constituted immediately began his operations, first making his pupils protest in their customary theses, and then procuring two decrees against the enemy, one of the Town Council, limiting Regius to his medical profession, and the other of the Academical Senate. In the latter the body of professors disapproved the new Philosophy for three notable reasons: first, because it contradicted the old system, secondly, because it kept the students in ignorance of the meaning of old terms, and lastly, because it led, or might appear to lead, to consequences in opposition with other sciences, especially with orthodox Theology. Another pupil of Voet, Schoock at Groningen, was inspired by his master to publish a damnatory tract against Cartesianism. The irritable French philosopher, who had at first prompted the faithful Regius with arguments at his request, but wished to keep the peace as long as possible, now found himself openly accused of nothing less than Atheism, a rather dangerous charge even in the free republic, and resorted in his turn to vigorous measures. Besides publishing his well-known Letter to Voetius, he applied to the ambassador of his country, and with his aid to the Senate of Groningen and the Utrecht magistrates. After much throwing-up of polemical dust, Utrecht forbade its printers to publish any more controversial writings on either side (1645), and Schoock, who had betrayed the suggestions of his chief, narrowly escaped an action for libel on the latter. Henceforth peace reigned at Utrecht, under the auspices of Voet and his two sons Paul and Daniel, each in turn called to a philosophical chair by his influence (1641-53 and 1653-60). Straight from the deathbed of the younger the brave old father went forth to make interest with the authorities for the Aristotelian cause, but this time the office was given to a young kinsman of some of the town magnates themselves, Regnerus van Mansvelt, a Cartesian (1660-71). Only a few years before his death, the veteran divine had the satisfaction of seeing another of his true pupils, Gerard de Vries, first a reader (1671-72), and then a professor (1674-1705) in the place of his offspring. Yet towards the end of the century this same de Vries was reported to have but little influence, and to have yielded on certain points to the current of neology.

Meanwhile at Leyden the study of Philosophy had not thriven under the successors of Burgersdijk: Jo. Bodecherus the Latin poet (1629-38), Dan. Sinapius, promoted from his place in the States' College to an ethical professorship (1635-38), and Franc. du Ban, a Frenchman (1635-43). In 1641 the glib-tongued Adr. Heereboord* attempted to revive it, protesting against the slavish respect for Aristotle, which that great thinker would have been the first to disclaim, and teaching Logic on a plan of his own. Of course he was called to account before the Rector, Otto Heurnius, an aged professor of medicine who had lectured on Logic in his early days; but the Curators allowed him to proceed as he had begun. Soon after this we find him in raptures with the first works of Descartes, and what with his lessons, the reports from Utrecht, and the residence of the French thinker in Leyden and its neighbourhood, the seeds of neology began to germinate among the students. To escape this danger, some conscientious youths actually went to Utrecht for lectures on orthodox Metaphysics; so the Leyden Curators, at the urgent request of their theological faculty, determined for the first time to open a public metaphysical course (1644). On the advice of Salmasius they secured the services of Adam Stuart, "*vir in philosophia Roscius*," sometime professor at Sedan, whose Scotch antecedents I have not been able to discover, but who at that time appears to have stayed in London. He at once proved himself as ardent a controversialist as any of the Voet family, and openly opposed Heereboord, who since 1645 had lectured on Ethics as well, and had sought to point out the difference between the followers of Aristotle and those of Nature. The great topics of the day, the legitimacy of universal doubt, and the attributes of the Deity, were drawn into every public disputation, and such was the vehemence of Revius, Regent of the College, and Trigland, a Professor of Divinity, that Descartes lodged a formal complaint with the Curators (1647). He only obtained a decree prohibiting all mention of his theories in the University. But Stuart, continuing his attacks on the doctrine without naming its author, found a fresh opponent in Jo. de Raey, doctor of medicine and a pupil of Regius, who had played a part in the Utrecht quarrel six years before, and now insisted that the decree should be respected to the letter by one party as well as the other. This led to violent scenes and some passionate pamphlet writing, after which the Curators put a stop to the proceedings (1648).

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* One of his works, the *Philosophia Naturalis*, is said to have been reprinted at Oxford in 1665.

For the next quarter of a century their policy appears to have been one of mediation. In 1656 the professors of Philosophy and Divinity had to promise not to encroach upon each other's province. Adam Stuart died in 1654, but by that time de Raey had been his colleague in the faculty for three years (1651-68). Poor Heereboord, addicted to wine and rather a shallow rhetorician, died in 1661, and was replaced by David Stuart, who inherited the opinions of his father without his quarrelsome temper (1661-69). During the same time the Leyden students had the opportunity of hearing a talented Cartesian from foreign parts, Arnold Geulincx. Born at Antwerp, and educated at Louvain, he had been a brilliant professor in that university for twelve years, but fled from the place to become a Protestant at Leyden, where he was looked on with suspicion, and only supported by the charity of a theological professor, Abr. Heidanus. At last an extraordinary professorship was bestowed on him (1665), but poverty and disappointment put an untimely end (1669) to the career of one too little known, whom I incline to consider the most original thinker ever seated in a Dutch philosophical chair. In 1669 and '70 the balance of parties was reversed by the appointment of two decided Cartesians, Burcherus de Volder (1670-1705) and Theod. Kranen (1670-73), while the tradition of Scholasticism was preserved by a mere reader, Wolferd Senguerd, the son of the Utrecht Aristotelian, who had spent his last years (1648-67) at the Athenæum of Amsterdam.

However the French invasion of 1672 and the nomination of William III. drew on a reaction in favour of the time-honoured system. Fred. Spanheim, the theologian, often annoyed by petulant Cartesian juniors, had the consolation of seeing some of them banished from the University; Kranen removed into the medical faculty; while Senguerd and a certain Wilhelmius were installed as professors (d. 1724 and 1677). De Volder, a peaceful savant, though faithful to the losing side in politics, kept his place mainly on account of his skilful scientific experimenting. Moreover the clergy prevailed upon the Curators to promulgate a syllabus of errors not to be defended any more; for instance, "*Omnem philosophiam esse religionis expertem, summumque hominis bonum esse animum sua sorte contentum*". Heidanus venturing to remonstrate against this measure both as a Cartesian and a Coccejan in theology, was ruthlessly deposed in his eightieth year (1676); while a scrupulous French divine, Steph. le Moyne, took courage to accept office in a university thus happily purified of modern abominations.

Warded off, as far as possible, from Leyden and Utrecht, the new philosophy continued to flourish at Amsterdam, where its staunch defender de Raey professed from 1669 to 1702, and Jo. Theod. Schalbruch, the editor of Clauberg's works, from 1698 to 1722.* Even at Harderwijk it was favoured by Corn. van Thiel (1655-88), and more openly by Ger. Wijnen (1691-1722); and at Groningen, notwithstanding the Statutes, by the historian Tob. Andreae (1634-76), Ger. Lammers (1667-69), and two Huguenot refugees, Jac. Gousset (1691-1704) and Mich. Rossal (1724-44). Franeker was a hotbed of Cartesianism under Jo. Greidanus (1658-68), Jo. Wubbena (1664-78), Jo. Schotanus a Sterringa (1678-99), Abr. Gulichius (1679-80), Tob. Andreae the nephew (1681-85), Herm. Alex. Roëll (1686-1704), and Ruard Andala (1701-27). Yet here also the Scholastic tradition was designedly kept up by the appointment of Christoph. Munster (1651-60), Abr. Steindam (1664-72), and Jo. Regius (1686-1738), the last of his tribe, who had to eke out his means by the practice of medicine, while striving to the last to stem the flood of modern speculation. A common weapon against Cartesians in those latter days was an accusation of Spinozism, which was repeated likewise against their successors.

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* Of the philosophical teaching of the famous Tib. Hemsterhuis (Amst. 1705-1717) there is little or no record.

Of these the foremost in age and fame was the great experimentalist Will. Jac. 's Gravesande, who had visited England as secretary to the ambassadors sent to compliment George I. on his accession to the throne. Called to a chair of astronomy and mathematics at Leyden in 1717, he was the first on the Continent to teach the natural philosophy of his revered friend, Sir Isaac Newton.* From 1734 to his death in '42 he also lectured on Mental and Moral Philosophy, and here he was evidently inspired by the doctrine of Leibnitz, as vulgarised in the writings of Christ. Wolff. Thenceforth the professor of Philosophy in the United Provinces was a physicist in the first place. Logic had, since the disgrace of Peripatetic lore, lost much of its attractions. So had Metaphysics, when the students of nature began to give up even Cartesian hypotheses, and attempting to proceed by the light of experience alone cared for abundance of ascertained facts rather than systematical completeness of theory. Reason had ceased to assert its omnipotence, though it retained its feeling of responsibility and a distrust of theories not altogether "clear and distinct". Accordingly, on ethical as well as metaphysical subjects, it was fain to retire upon safe generalities, getting clear of troublesome questions by a *non liquet*, or an appeal to Christian revelation. The title of Eclectic came again into favour, and Cicero was hailed once more as the model of a philosopher. Calvinism, too, had lost much of its rigidness, and could hardly find fault with a Philosophy so modest, and so ready to stand sentinel against the many sad infidels of the day. In this way, the eighteenth century, together with part of the next, as represented by our Academical Philosophers, became an age of innocence, blissfully unaware of the real difficulties of human thought, and wondering with a placid smile of superiority at the eccentricities of past and present innovators. Well-disposed students doted on the plausible commonplaces of preceptors like Nic. Engelhard (Groningen 1728-

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* An older Dutch Newtonian, who showed experiments relating to the new theories in private, was Bern. Nieuwentijt (1654-1718), M.D. and alderman of Purmerend, a pupil of de Volder and Kranen, and as such an ardent Cartesian in his youth. Dislike of hypotheses, and love of experiment, as practised even by Senguerd, made him turn to the Latin works of English authors. Of his two chief works in Dutch, one, on the evidence from nature for the existence of a Deity, was translated into English, and largely borrowed from, it is said, both by Paley and Chateaubriand. The other, printed after his death, is a treatise on mathematical method in refutation of Spinoza.

65), Jo. Lulofs (Leyden 1742-68),* Dion. van de Wijnpersse (Gron. 1752-69, Leyden 1769-1805), Jo. Fred. Hennert (Utrecht 1764-1804), Jo. Theod. Rossijn (Harderwijk 1765-75, Utrecht 1775-1815), Bern. Nieuhoff (Deventer 1775, Harderwijk 1775-1818), all men of learning and sense, but without the spirit of speculative enterprise. The savage disputes of old, between schoolmen and inquirers, had died out long ago. Instead of them, essays and dissertations found plenty of cultivated readers outside the Universities, and their writers were encouraged to stand up for religion and morality by promises of gold medals and fine type. There were the Society of Sciences at Haarlem, Teyler's Society in the same place, the Society for the Defence of Christianity at the Hague, the Stolpian Fund at Leyden, all established in the latter half of the century, and holding out their yearly prizes. Among their early laureates one of the most esteemed was the Mennonite preacher, Dr Allard Hulshoff (d. 1795), from the Wolffian school of Engelhard, and even professors like van de Wijnpersse and Dan. Wyttenbach, more celebrated as a philologer, were proud of their approval. Turning over the leaves of their stately quartos and octavos, we now vainly try to appreciate endless rehearsals, in wordy Latin or indifferent Dutch, of the same worn-out demonstrations. Surely the worthy prizemen's success must have been something like that of the redoubtable Father Provincial,† "*qui super duas disputationes strenue se habuit contra haereticos, et superdisputavit eos omnes, sed noluerunt ei credere ipsi infideles*".

In point of fact, I suspect the best men of that period to have shared Ruhnkenius's opinion: "*suavitatem fructumque philosophiae positum esse in ratione et forma, non in materia et argumento; quippe de cujus veritate omnia esse incerta*".‡ Even Franc. Hemsterhuis (1721-90), the professed Platonist, who despised Cicero as a philosopher, would have Philosophy entirely separated from Science, and told his readers that the human soul was designed to contemplate and to enjoy, and not, as it seemed, to understand its objects. In spite of a slight tinge of the doctrine of Spinoza, he draws the regulation dogmas of moderate eighteenth-century Deism from the depths of his inner consciousness, and for his much-admired speculations on love he is indebted, rather than to the *Symposium*, to his innocent flirtings with Mesdames de Galitzin and Perrenot.* Still the classical studies revived by his father Tiberius (1685-1766) had the good effect of discrediting the mock mathematical demonstrations of the Wolffian imitators. Also, the contemporary Scotch thinkers began to be noticed by men like Hennert †; and on the whole, by various influences, Philosophy in the Universities themselves was brought near to a level with polite literature. "Clearness and distinctness," a by-word ever since Descartes, assumed the meaning of plainest possible intelligibility. Only the language of the lecture-room remained Latin, though it rarely attained the accomplished elegance of Wyttenbach's *Praecepta Philosophiae Logicae* (Amst., 1781).

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* One of Lulofs's pupils was Elie Luzac the Wolffian, Doctor of Law and printer at Leyden, who wrote in French, besides other works, a refutation of Lamettrie's *L'Homme Machine*, entitled *L'Homme plus que Machine* (1748).

† *Epistt. Obscur. Viror.* I. 49.

‡ Wyttenbachii *Opuscula* I. p. 535, in Vita Ruhnk.

When Kant emerged into European celebrity, his works were received in these parts with more doubt than applause. Except for a rectorial oration of Ant. Chaudoir at Franeker (1792), and the lectures of Hennert and the young Ger. van der Voort at Groningen (1790-93), he was barely mentioned by the official men. At Amsterdam he met with an active apostle in Paulus van Hemert, formerly a professor at the Remonstrant Seminary, who published a couple of treatises (1792 and '96) and six volumes of a magazine (1799-1803), in which he was joined by a small number of rising talents. When their journal proved too heavy for its intended readers, van Hemert tried a more literary and popular one, which by his ready wit was kept alive for four years more. In those same years (1804-8) some of the best Groningen undergraduates carried on a junior Kantian Society. Provoked by the contemptuous treatment of received opinions and their timid advocates in the Amsterdam publication, van de Wijnpersse in his extreme old age published some anonymous remarks on the dangerousness of the Critical doctrine (1805), and Wyttenbach (1807) attempted to ridicule the new metaphysical fever, upbraiding Kant for ignorance of history and van Hemert for neglect of Latin, discourteousness, and oblivion of personal benefits. A fierce literary war between the veteran with his school and the Kantian chief was kept up in Latin during the next seven years. After this, the movement, always limited to a small circle, slowly died out in the country. The last Kantian relic was an orthodox village clergyman named le Roy, who persisted in considering his master the destroyer of Rationalism, as showing by his sceptical arguments the necessity of a supernatural revelation.

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* As to the Platonic dialogues of Madame Wyttenbach, they are but clever exercises in French composition.

† Will. Laur. Brown, who died in 1830 as Principal of Marischal College at Aberdeen, was born at Utrecht in 1755, and officiated there as Professor of Moral Philosophy, etc., from 1788 to '94, using Hutcheson as a textbook. Beattie's *Elements of Moral Science* were translated under Hennert's auspices, and published in 1795. But the Scotch influence is visible, even in 1781, in the latter's *Aphorismi.*

Napoleon, during his short occupation of the country (1810-13) was pleased to abolish two of its Universities, degrade Utrecht to the rank of an *école secondaire* (whatever that might mean), and incorporate Leyden and Groningen as *académies* with his comprehensive *Université de France.* As a consequence, the Faculty of Philosophy and Arts, once the nursery of unbigoted thought and general culture, was cut asunder on the new French plan into one of Science and another of Literature. After the downfall of the Empire, the Royal Decree of Aug. 2, 1815, on University Education, ratified this disruption, but introduced the titles of *Facultas Disciplinarum Mathematicarum et Physicarum* and *Facultas Philosophiae Theoreticae et Literarum Humaniorum.* In all the five faculties the degrees of Candidate and Doctor were to be obtainable by stated examinations; but students of Divinity or Law had first to take a special degree in Literature, and those of Medicine a similar one in Science. Besides, to keep up a connection between the great divisions of university-work, there was introduced an elaborate system of certificates of attendance on lectures in different faculties. For instance, while philologers were examined, everyone else had to produce his certificate in Logic; Metaphysics and History of Philosophy were examination-subjects for the literary doctorate, but the lectures must be attended by students in natural science and in theology as well. The whole form of education set forth in the new Decree was an ingenious compound of the old plan of a liberal education and the novel one of mere professional training; and in the course of sixty years it has proved a practical failure. First, the arrangement of Grammar Schools was for the most part left at the mercy of municipal authorities, under whose too often tradesman-like rule sound classical instruction was allowed to decline by degrees. From 1845 to '49 a Government Commission was appointed to examine for matriculation, and thus set up a fixed standard of proficiency; but this was soon discontinued, and matters were left to grow worse than ever. Seeing men admitted to the University from imperfect schools or scanty private tuition, parents began to think it a wise thing not to detain their boys in the higher forms of well-conducted establishments. The old custom of lecturing in Latin, sanctioned as a rule by the Decree of 1815, had to be abandoned, not so much because of modern notions as of deficient understanding of the language. A more serious disadvantage was the neglect of a thorough training of the mental faculties, owing in part to the multiplicity of subjects gradually introduced into preparatory schools for the mistaken purpose of a many-sided instruction. Secondly, the literary *propaideia,* as it was called, at the University could not answer its aim because the same teaching had to serve for future philologists and for everyone else; also because the plan had been subsequently improved upon by a separate examination in mathematics. Undergraduates felt that only the very best of them could really satisfy the conditions of the system; and hastened to get rid of their mathematical and classical obligations anyhow.* In the third place, certificates of attendance appeared to mark a subject as being of little importance, and it was hard to refuse them, especially where other duties rendered such attendance a positive burden, and many without their own fault were ill-prepared to derive a real benefit from what they were commanded to hear.

Under this system, philosophical teaching was naturally esteemed by most young men a kind of troublesome "survival" from the dark ages, and had moreover to be kept down to the level of intellects little accustomed to serious exertion. Of the four subjects mentioned in the Decree, Ethics was after a time left off as a useless duplicate of Moral Theology, and Metaphysics generally coalesced with History of Philosophy. Nor was there much chance of rivalry of opinions in the same place. For as the State was at the charge of maintaining three Universities,† there must needs be a limited number of chairs, and in one instance, at Utrecht, Philosophy was divided for some years between the professors of Mathematics and of Greek. Amsterdam, being a mere city Athenæum, trusted as of old to its physicist, until it happened to meet with an orientalist, Dr. Taco Roorda, much interested in philosophical studies;‡ and since he left the place in 1843, both branches of learning have been represented in combination by his three successors, now all employed as professors at Leyden, but of whom only one continues to teach Philosophy.

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* At Leyden, from Sept. 1876 to June '77 (the unit of University time always embracing a whole year), there were 118 examinations by the Literary Faculty, of men destined for the study of Law. Four of these passed their propaedeutical stage "*summa cum laude,*" seventeen "*non sine laudibus*" sixty-three passed without comment, and thirty-four were plucked.

† Leyden, Utrecht, and Groningen. Moreover there were at first the State Athenæa of Harderwijk and Franeker, abolished in 1818 and '43.

‡ A paper of his, on the present condition of Philosophy in the Netherlands, appeared in I. H. Fichte's *Zeitschrift*, Vol. X. (1843). He wrote in Dutch on Psychology (in the German manner) and the Philosophy of Language. For the last thirty years of his life, he was the chief representative of Javanese philology.

In practice, lecturers on Logic had the option either to attract an audience by avoiding technicalities and by a plentiful sprinkling of literary condiments, or to stick to their subject and drive most of their hearers away. One of them, who tried to take a middle road between the two extremes, and to give some value to his certificates by a little private examination, found the outlines of Formal Logic looked up to as little short of the Differential Calculus. As for the Metaphysical course, it had to be sweetened with historical matter, and hardly left a vestige in the youthful mind beyond a few dates and ready-made formulæ. There was no time to give anything like a complete survey; anyone taking an interest in philosophical discussions felt extra time spent on them as detracted from his proper avocations. Also, Divinity professors took to giving parallel lectures under the title of Natural Theology; and for the sake of the philological students and their final examinations the best plan was after all to devote the one year that was available to an account of Greek philosophy from Thales to Aristotle.

Of the dozen or so of professors representing Philosophy during this last period, none became properly followers of the great contemporary German schools. It is true that the well-read Jac. Nieuwenhuis (Deventer 1816-22, Leyden 1822-43), after admiring Geo. Hermes of Bonn, took some part in recommending the views of Krause, as explained in French by Ahrens; also, the present titulary at Utrecht was at one time their eloquent advocate. Again, the liberal Catholic, F. C. de Greuve (Groningen 1831-62), gave some evidence of a leaning towards Hegelianism. Others, like the lofty-minded Mart. des Amorie van der Hoeven (prof. of Law, Amsterdam 1848-68), were deeply impressed by the German speculations; but their allotted place was not in a philosophical chair.* On the opposite side, divines like E. A. Borger † scornfully warned their countrymen from wasting their attention on those foggy and comfortless foreign productions; and even one of the old Kantian set of van Hemert, J. F. L. Schröder (Utrecht, 1817-44), turned out in his mature age to be an anthropologist of the common-sense and common-place school. A sound mathematician, a man of most extensive reading, and an earnest and amiable moralist, he held his own beside the popular Ph. W. van Heusde (Utrecht 1804-39), a pupil of Wyttenbach and an unceasing expounder on the nature and history of Man, who inspired his hearers with an ardent love for Plato without penetrating very far into the depths of that master mind.* After these, Utrecht had the good fortune to obtain the services of Dr. C. W. Opzoomer (1846). By his fluent and tasteful lecturing many have learnt to admire a form of doctrine derived in the main from Comte and J. S. Mill, but supplemented by a divorce between scientific and religious truth, so as to find room for a broad type of Protestantism. One of the leaders of the "Modern" party in the Church, he has also distinguished himself as a commentator on Dutch Civil Law, and as a careful student of Modern Literature. Like his two predecessors, he has earned the fame of a promoter of intellectual life far beyond his official sphere, and spokesman of a goodly number of our most cultivated men. From his school came forth the Chevalier van der Wijck, professor at Groningen since 1863, who appears to turn his attention chiefly to the propagation and improvement of modern British Psychology.

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* For this reason I must also refrain from reporting on the original attempt of one of van Hemert's old comrades, Dr. J. Kinker (d. 1845), to complete the Kantian system in his *Essai sur le dualisme de la raison humaine*, published after his death in an unfinished state (1850-52).

† *Disputatio de Mysticismo*, Harlemi, 1819, Hagae Com., 1820.

Outside of the Universities, various thinkers have found an echo in the country. From 1828 to '30, and again in '36 and '37, a Hegelian periodical was published at the Hague by a small body of believers. Among the material supporters of Comte there were certain military officers in the Dutch service, and more than once the Positivist doctrines, both original and as reformed according to M. Littré, were recommended to our notice. They even contrived to present themselves in the form of a dissertation for the degree of Doctor of Divinity.† Others again looked for their guidance to the systems of older ages. Dr. A. J. Vitringa made interest for the emanation-theory of Plotinus, and Dr. J. van Vloten devoted many years to the task of getting credit for our own Spinozà as the Philosopher of the Future.‡ A variety of heterodox opinions, from Deism to Secularism, were advocated side by side in the volumes of the *Dageraad* (Dawn), a special journal appearing at Amsterdam for several years since 1856. Throughout our theological and general literature there are indications of a sincere interest in certain philosophical questions, much desultory reading about them, and a desire to have them answered to one's personal satisfaction. The self-contented "Eclectic" or "Christian Philosopher" of the last century, though still largely represented in the ranks of elderly clergymen and jurists, is now becoming a figure of the past. In his place, drawing-room freethinkers would compound for a similar makeshift, the "Poet Philosopher," and their friends in the laboratory try to construct a creed out of the tentative assumptions of Science. But habits of scientific thoroughness, acquired by steady application to any class of problems, give rise to a demand for something of a quite different type. Where methodical research is attempted, it remains to be seen whether the rising generation will avoid the slough of sceptical despondency and find its way to rational convictions of its own.

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* *Initia Philosophiae Platonicae* 1827-36, 2d ed., 1842. *Characterismi principum Philos. veterum* 1839. In his Dutch works, especially the *School of Socrates* (1834-9), of which there exists a German translation, he advises his countrymen, on the strength of a theory of national capabilities, to abstain from competition with others in the field of independent philosophical research, and study the ancients merely for their own edification. His tomb was inscribed with a sentence of his own: "How could he be called a philosopher who does not believe as a child?"

† Dr. l'Ange Huet, Leyden 1866.

‡ Of purely historical contributions, I need only mention the Fragments of Xenophanes, Parmenides, and Empedocles, edited (1830-38) by S. Karsten, the pupil and successor of van Heusde; the dissertation of his son H. T. Karsten, *de Platonis quae feruntur epistolis* (*Traj.* 1864), and the remarkable studies of the late P. A. S. van Limburg Brouwer on Indian and Chinese speculations, published in the *Gids* (Guide)

From the first of October of this present year our Universities will be subjected to the Law of April 28, 1876, and the Royal Decrees appertaining thereto. The main feature of this law—considered by many to be a patched-up compromise between contradictory principles—appears to be an absolute division of labour. The Grammar School, or Gymnasium, as reformed within the next four years, is to be the place for liberal education, and to absorb all that went under the name of literary *propaideia*; whereas the University becomes the place for such professional training as requires some knowledge of Latin and Greek—a mere aggregate of special schools. Certificates of attendance are abolished altogether. The five Faculties remain as they were. Only that of Divinity is loosened from all connection with church or sect, leaving its former dogmatical and practical teaching to be pursued in ecclesiastical seminaries;*

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monthly magazine, and intended apparently to invalidate the vulgar conceptions of human nature and self-evident truth.

* Institutions of this kind, mere schools without living in common, have been kept up for many years in close connection with the Athenæum at Amsterdam, by the Remonstrants, Mennonites, and Lutherans. Nor are the scholarship and social status of their ministers in any sense inferior to those of the clergy turned out by the universities. There is no state church in this country since 1795; so legislation is but consistent in placing all denominations on the same footing. The present Remonstrant Professor of Divinity is established at Leyden, and without belonging to the University, took a share in its teaching as if appointed to an extraordinary chair. Under the new Law he is to hold office in the University as well, on the strength of his happening to be our one

and in those of Law, Natural Science, and Literature, men may follow different paths and obtain different degrees. Instead of one kind of *Philosophiae Theoreticae Magistri, Literarum Humaniorum Doctores,* as ordered in 1815, we are in one Faculty to have special Doctors of Classical, of Semitic, and of Dutch philology, of that of the East-Indian Archipelago, and of Philosophy. The latter will be different from anything yet known in history. A young man of eighteen, fresh from his Gymnasium, is to be instructed in Logic, Psychology, and the history of Greek and Roman Philosophy, and then to take the degree of Candidate. By another examination, concerning Mediaeval and Modern systems, and Metaphysics, "in its full extent and all its applications," together with a dissertation to be argued on for an hour, he may conquer the title of a Doctor, and afterwards—repent of his neglected education. Certainly such a scheme did not come into being through any oversight on the part of those who will have to carry it out. The only chance of counterbalancing its evil effects would be in a combination of the Philosophical with some other curriculum; provided one could afford to stay for a couple of years beyond the usual time. Philosophy being thus pushed aside into a corner of the academical system, should try to get a voluntary hearing from the best students of every class; but then there is the difficulty of finding suitable hours, and procuring due consideration for intricate problems without the inducement of some present reward. The student of Classical Literature alone will be obliged to acquire some notion of Ancient Philosophy for the sake of his first degree. Perhaps the cause of independent thought will be best served by carefully written books for private reading. Philosophy at large can dispense with Universities, but Universities that try to dispense with Philosophy will be found in the long run to tamper with the mainspring of their own constitution.

J. P. N. Land.

Leyden, August, 1877.

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specialist in the History of Religions. Among the old philological and philosophical professors of the same denomination were Jo. Clericus (le Clerc, 1684-1736), the friend of Locke, Dan. Wyttenbach (1771-79), and Paulus van Hemert (1790-96).

VII.—CRITICAL NOTICES.

Des Sociétés Animales: Étude de Psychologie Comparée. Thèse soutenue devant la Faculté des Lettres de Paris. Par ALFRED ESPINAS, Professeur de Philosophie au Lycée de Dijon. Paris: Germer Baillière, 1877.

M. Espinas takes possession, in the name of a new science, of ground that is all but unoccupied. The study of the social ways of animals has not indeed been neglected, and in the case of many species has been pursued by skilled observers. But it has been treated mainly as an appendix to Natural History, and in the spirit of that method. The movement which has converted this tract of knowledge into a fruitful field of speculation has derived its impulse from two very different quarters. The foundation of a Social Science almost under our eyes has taught us what to look for in the lower forms of social life. But it is chiefly to the discovery of the organic connection between man and the non-human animals that the subject owes a scientific status. Mr. Darwin has himself applied his principles of Natural Selection and Sexual Selection to the elucidation of many of its phenomena. M. Houzeau has in various relations exhibited the continuity between animal and human societies. Signor Zannetti has compared the animal and human forms of the family, with the view of educing the laws which govern both. And Mr. Spencer, while ostensibly dismissing the subject as having only a preliminary interest, has vindicated its importance by devoting an entire division of his *Principles of Sociology* to establishing the analogy between the social organism and animal organisation. M. Espinas is under obligations to several of his predecessors, especially to Mr. Darwin and Mr. Spencer; but his conception of the subject is his own. Widening it at the lower extremity so as to take in the lowest animal existences, and tracing without a break the lines of connection between these and the highest mammals, he has aimed at constituting this branch of inquiry into a homogeneous whole, with defined limits and a peculiar province, which may fitly be named Animal Sociology.

Comte has somewhere speculated on the reasons why man alone of all the animals has succeeded in forming societies. As a matter of fact, there is no animal that has not formed societies, which are proportionate—excepting among the more predatory species—in point of size, complexity, and compactness, to its rank in the scale of nature. No living being, says M. Espinas, is alone. From the lowest to the highest, all the animals are to be found, at some moment of their existence, sharing a common life. We may even see reason to conclude that, so far from association being the flower and crown of the animal kingdom, society is the primary fact, and families and individuals secondary and tertiary—that societies are not "formed out of aggregations of families," and families out of groups of individuals, but that families and individuals are specialisations of societies and have been developed within them. Sir H. Maine has exhibited a time when individuals did not (in a sociological sense) exist, and families were the units of the State, while Mr. McLennan's remarkable inductions carry us back to a remoter period when families were not yet distinguished within the tribe and the tribe was all-in-all. M. Espinas's researches seem to furnish a basis for theories which have still a certain character of empiricism, by unfolding a far more distant epoch when in a physiological sense the individual did not yet exist, and when the animal organism was an 'undifferentiated' mass which contained within itself the germs at once of family and individual.

Societies are normal or abnormal. They are normal when formed by animals of the same species which cannot live independently of one another. They are abnormal when formed by animals of unlike species which live together rather from convenience than by necessity. M. Espinas begins with the latter, which fall into three groups. *Parasitism* is an enforced association in which a smaller animal lives attached to the body of a larger and preys upon that. It is the antipodes of the social life, since it degrades both parasite and prey; its sociological significance is that it is a prolongation of the struggle for existence sustained against superior new species by the inferior ones already in possession of the earth. Resembling the chase in its lower forms, in its higher it approaches the second group. *Commensalism* occurs when an animal lives on the remains of another's meals. Both groups lack the essential elements of society, but their discussion may be defended on the ground that they are not without analogies in human societies, and because they shade off insensibly into the third group, with which real association begins. When animals of similar habits come together in similar circumstances, voluntary amicable relations never fail to arise between those species which have nothing to fear from one another and have the same enemies. As they render one another services, this mode of union has been named *Mutualism.* Its lower forms are well known, and we pass at once to the highest of all. Domestication is not indeed a voluntary association at the outset; but its success and its continuance rest on a powerful hereditary tendency which is found in the free state among all the animals that have been domesticated—the instinct of voluntary subordination to the stronger and more intelligent. The early emergence of this instinct is deservedly signalised by the author, because it is the chief basis of even human government, which, if it rests partly on the possession of force by rulers, rests yet more on the willing submission of the ruled. As felt by one animal for another of the same species, it is comparatively primitive: so far down does hero-worship go. As felt by animals for man, it is obviously acquired, and M. Espinas speculates ingeniously on the mode of its acquisition. He produces facts which suggest that man acquires dominion over a herd of animals by living their life and thus becoming half an animal himself, and in virtue of his superiority taking the place of the natural head of the troop. Such conquests are in a single known instance made by one animal over another of a different species. It is the less surprising that they should occur among ants because, as Sir J. Lubbock has recently contended, the disproportionately large brain and developed social ways of the ant give it a plausible claim to rank next to man. The characteristic facts are that ants of certain species rear in their nests the pupæ of other species, that the latter perform duties which have caused them to be denominated slaves, and that this practice is continued from generation to generation. In seeking to explain the instinct which a practice so transmitted implies, M. Espinas comes upon the latent controversy which divides the evolutionists. It is not always easy to reconcile Mr. Darwin's different statements, but his view may be taken to be that the mental faculties throughout the animal kingdom have been acquired and perfected mainly by natural selection. Mr. Spencer, on the contrary, is understood to ascribe organic development in a great degree, and mental evolution wholly, to inherited increase of function produced by the continued exercise of an organ adapting itself to surrounding conditions. In dealing with the problem before us, as well as generally, M. Espinas rather pointedly rejects Mr. Darwin's solutions, and accepts, though not avowedly and with the omission of essential parts of it, the doctrine of Adaptation.

His criticisms on the application of the theory of Selection need not detain us. One of them has been answered in anticipation by Mr. Darwin, another by the author himself at a later stage, and a third seems to rest on a misconception of the theory. Still it may be admitted that the attempts of Darwinians to explain the origin of the mental powers have been more hypothetical than demonstrative, and it may be doubted whether success is possible until the theory becomes more specific. At all events the field is open for alternative explanations. In opposition to what he would doubtless style physical hypotheses, M. Espinas propounds "une tentative d'explanation psychologique". The gist of it is that animals of a certain degree of intelligence perform, from an excess of energy, (this must be the assumption) a large number of experimental actions *pour voir*—'out of curiosity,' that the ant possesses this degree of intelligence, and that the actions by which the ant acquires and domesticates slaves are a series of such experiments, each of which demands but small power of adaptation, but which culminate in the acts characteristic of domestication. The criticisms that the amount of energy possessed by inferior organisms is rarely in excess of their absolute needs, and that curiosity is not a characteristic of the lower intelligences, might be accentuated if the defects of the hypothesis were not more serious. M. Espinas apparently does not (at least at this point—he does afterwards) see that new powers are acquired only under pressure of some necessity, and that this is as essential a part of Mr. Spencer's as of Mr. Darwin's theory; and he accordingly fails to state what are the new conditions to which the ant must adapt itself, or what advantage it gains by so doing. It is an equally fatal objection that he altogether omits the element of inheritance, so that he is obliged to assume that successive generations of ants go through the same processes in the same order without any organic tendency thus to repeat them. This is no accidental omission of an element which has only to be added to make the hypothesis a sound one. It is a consequence of the theory of adaptation, according to which the instincts of neuter ants must have been acquired by these ants performing new actions which gave rise to new nervous connections; but as neuters leave no offspring, the new nervous structures cannot have been inherited. The way in which the principle of selection enables Mr. Darwin to get over this difficulty may be the true solution of the problem, or it may be only a speculative *tour de force*, but it must be acknowledged that however probable the doctrine of adaptation may appear—and its probability increases as we ascend the scale, though Mr. Romanes's recent experiments show that it is applicable as far down as animals with only the rudiments of a nervous system—it has peculiar obstacles to encounter in seeking to explain the facts of instinct in ants.

In passing to normal societies we are met by the question—what are the limits of the Social Science? Assuming (and the assumption can be better justified by results than by reasoning) that associations of animals fall within them, how far down the animal scale are we to go? At the bottom of it are to be found individuals which are each "a minute group of living molecules or physiological units". Are such associations to be regarded as societies? and is the individual itself a society? M. Espinas rests an affirmative conclusion mainly on the ground that our notions of individuality are narrower than the facts, that the individual is variable and individuality relative, and that the so-called individuals are really groups of individuals of a lower order. It is a perfectly valid argument, but the inclusion of such groups will be best vindicated if they are shown to be regulated by laws similar to those which regulate the admittedly social groups. Again, if such animal forms are societies, are not plants societies too? M. Espinas admits that this may one day be shown, and that the study of them in this relation will then become a part of the Social Science; but it would seem that the fact has been already demonstrated. And lastly, to drive the wedge home, if animals and plants are societies, are not masses of inorganic matter also societies? It does not seem conclusive to reply with the author that the latter are not living beings, when every day the division between living and not-living is becoming fainter. From nations to nebulæ, from the ordered dance of the atoms to the most spiritual relations which bind man to man, there is nowhere any such breach of continuity that we can say, on this side of the line there are associations which we can call societies, and on the other aggregations which are something quite different. Stretched to this extent the word society loses its meaning, and there is some reason for agreeing with those who confine it to human associations, and who describe inquiries into præ-human aggregates as Præ-sociology. But the study of the higher aggregates will be empirical unless it is based on that of the lower, and it is probable that we shall have not one or two but a series of sciences dealing with the successive groups. Each of these will demand a distinct order of inquirers—physical, chemical, biological, and sociological, each acquainted with the results reached by the others, and when some approach to completeness has been made, and the gulf which separates the different sciences has been bridged, we may have a single science dealing with the whole range of the phenomena.

In the meantime we must follow M. Espinas, who begins with associations of biological units, or, as he names them, Societies of Nutrition. Nutritive societies are so-called because the end which their associated existence subserves is the nutrition of the individuals composing them. This which is the final cause of the earliest and simplest associations, remains the basis of the highest and latest. As we rise from Nutritive to Reproductive, and from Reproductive to Relational Societies, it indeed becomes more and more subordinated, as the relations among the individuals become less and less material. But it never ceases to be the foundation of even human association, and it is from this root that all other ends and relations—even the most spiritual—have grown. Societies which are solely nutritive have this character in common that the individuals composing them have been attached to one another from their birth and have never lived isolated: societies are primary. They fall into two classes. (1) Those without vascular communication, as the various orders of Infusoria. They are formed by segmentation: the parent mother-cell splits into a considerable number of cells which remain connected with one another, among the lower orders by simple juxtaposition, among the higher by an organic bond of a simple kind. The social unity of such groups is still feeble: their co-operation is hardly discernible. The individuality of the parts, which is in direct proportion to the unity of the whole, is equally feeble. The causes of such groupings have still to be discovered, but it may be assumed, in accordance with the theory of selection, that individuals so feeble have survived in virtue of their association. (2) Societies with vascular communication, comprising Polypes, Molluscs, &c. The form of association exhibited by these is constituted by the grouping of individuals which are united not only by the juxtaposition of their elements and the connection of their tissues (as in the case of animals without vascular communication), but even more by the permanent junction of their cavities. The true "social bond" is consequently, according to M. Espinas, the liquid which passes from one to another, and maintains the supply of nutritive elements. They are so arranged by M. Espinas as to exhibit successively higher degrees of the division of labour and organic cohesion, and the gradual formation of a nervous system, or its rudiments, with corresponding functions. In the later stages these combined processes result in the formation of a so-called individual (as M. Espinas would say, a collective individuality) or social unit. The important thing to be noted is that the organs and offices which we name social institutions and functions are already discernible in the parts composing the individual. How the composite individual subsequently develops in converse with other such individuals activities like those going on within itself is a problem which touches the roots of Social Science.

Animal associations which have nutrition for their object give rise by a slow and gradual transition to associations for the purpose of Reproduction. The connection of parts which is life-long in the earlier forms tends to dissolve; the communication of the individuals is momentary and often renewed instead of being lasting; and the individuals begin to lead independent lives. This separation takes place in close parallelism with the rise of sexual organs, which is again explained as a development of the division of labour. Their tendency to unite is accounted for by the fact that they are the descendants of individuals which were in permanent organic union, and are thus divided halves which are necessary to one another's existence and constitute a whole when united. If we might assume as prevailing among animals nutritively associated something corresponding to the instinct of self-preservation, then the sexual instinct might be explained as a modification of that primitive instinct. But M. Espinas is convinced that the physical explanation accounts only for the origin of the appetite, and that its maintenance depends upon certain "psychological bonds". These consist in manifestations of an æsthetic kind addressed by the male to the female, which may be arranged in the order of their decreasing materiality—caresses, odorous emanations, displays of colour and form (or costume), song, and lastly motions, at first simple but becoming more and more combined. Answering to these powers of expression, there must be in the female corresponding faculties of appreciation—more or less subtle senses, which have been at least developed by means of sexual selection. That they were also so originated even M. Espinas (who usually shies at Darwinism) inclines to conclude; but if (as seems to be the case) many of these manifestations are only the more ordered exercise of functions necessary for subsistence, their origin might be better elucidated by an expansion of the theory by which Mr. Spencer has explained the acquisition of the musical faculties.

The union of male and female is the first stage in the constitution of the Family. The second is the association of parents and offspring. Analogous to the fact which we meet with in human societies, that it is the relationship of children to mothers which is alone primitively recognised, it appears that the first form of this association is that of the mother and her offspring: it is only in the higher societies that the male becomes a permanent member of the family. A physical explanation is here, as everywhere, to be given. The offspring are at first but a continuation of the bodies of their parents, as colonies of cells were originally part of the parent cell, but the female remains longer physically attached to her offspring than the male. It is on this basis that M. Espinas explains the origin of the maternal affection: love of offspring is love of an "extended self". By successive developments and specialisations of this instinct the family gains an increasing unity in time and space. Under its auspices industry arises, from the necessity of preparing a shelter for the young: perhaps it would be more exact to say that it has two origins, the other being the procuring of food. Property arises out of industry, but only out of the two-fold form of it just mentioned. The accession of the male marks a new phase in the growth of the family. At first he plays a preponderant part, just as in barbarous societies kinship *solely* through males is substituted for kinship through females. The paternal affection springs up in the same way as the maternal. It is first observable in fishes, the males of which fecundate the eggs. They are thus veritably part of his own body, and are cared for as such: *paternal* love of offspring is also love of a prolonged self. What here wants explanation is the exclusion of the female from the care of the young. Subsequent developments of the paternal instinct (as in birds) M. Espinas explains as due to the desire for domination and the love of property (both specialisations of the instinct of self-preservation), but it is probable that the organic affection to which it owes its origin is never afterwards quite absent. Organised by this instinct the family attains still greater complexity and compactness, and prepares the way for associations of a higher type.

The Tribe has been until lately supposed to be a development of the family. It is not the least of M. Espinas's services to Sociology that he takes away the bottom from this theory. He clearly shows that where the family has acquired a high degree of unity (as among birds) the formation of a tribe rarely happens. On the contrary, hordes usually arise where promiscuity or polygamy prevails, as among the less predatory mammals. The full-grown family and the tribe are mutually hostile. No explanation of this is attempted, but it appears to be a law of nature that instincts have to be developed to excess before they are fitted to play a simply co-ordinate part. The maternal affection at first acts alone, reaches a high pitch, and then disappears for a time; the paternal affection at first alone operates and carries the organisation of the family to a point incompatible with a collective existence; then the instinct of sympathy, which had been leading an embryonic life, definitely emerges, and forms the tribe. We cannot follow M. Espinas in his analysis of this affection, but in no part of the work is his psychology more original or more suggestive,

In a closing chapter the author sums up the results of his inquiries in a number of "laws," necessarily of a rather vague character, descriptive of the nature, origin, development, and duration of animal societies. The conclusion that a society is a living organism, which has progressed from a state in which the relations among its members were physiological to one in which they are psychological, may be taken as approximately true, with the qualifications that the terms 'living' and 'organism' have connotations of a somewhat lower order than the facts, and that while the relations are slightly psychical from the outset they remain partly physical to the end. Most instructive applications of this general result to the theories of mind and morals conclude the work.

Even the foregoing rapid analysis may have served to show that M.

Espinas's volume is one of first-rate importance as a contribution both to social and mental science. Large and original in design, the execution of it may be said to be worthy of the plan. It is not indeed without defects: theories are started only to be dropped; hypotheses are laid down in one chapter and thrown over in another; and objections (as for example to Natural Selection) are repeatedly made throughout the work and repeatedly refuted in other parts of it. But these and similar inconsistencies may perhaps be ascribed to the circumstances under which the essay was produced and the restraints of the author's official position.

J. Collier.

Logische Studien. Ein Beitrag zur Neubegründung der Formalen Logik und der Erkenntnisstheorie, von F. A. Lange. Iserlohn: J. Baedeker, 1877.

This posthumous fragment is worthy, both in matter and style, of the author of the *History of Materialism.* The Editor, H. Cohen, tells us that it was completed three weeks before its author's death, but that it was begun before the preparation of the second edition of the *History;* and he remarks that its main principles are those which permeate Lange's Philosophy, and that accordingly the friends of the *History of Materialism* may take it as the exponent of the historical critic's systematic views. With these remarks we fully concur. It is an invaluable key to the *History*, especially to the most interesting part of it which deals with Kant and his influence.

The gist of the book is to show that the intuition of Space is the source of the *apodeictic* not in Mathematics only, as Kant held, but in Logic also. This is shown, first, by an appeal in detail to what we are conscious of in our own minds when we engage in the processes of Formal Logic; and, afterwards, by entering into what we may call the metaphysic of Space. The elegance with which these two portions of the present work are connected is very characteristic of Lange, in whom metaphysic always holds its legitimate place of style in relation to matter.

The work begins with a criticism of the apodeictic in the ordinary Metaphysic. The fact that metaphysicians are not agreed, proves that we must not look for the apodeictic in their various systems, for the apodeictic is self-evident and beyond dispute. The metaphysicians have had it so much their own way since Aristotle's time that the mere *form* of deduction has come to be identified with the apodeictic, however disputed in each system the principles may be and the conclusions derived from them. The professor of a systematic metaphysic thus elevates himself above the man of science to whom he denies the apodeictic. It is the object of Lange in the present work to vindicate against this professorial apodeictic that of *μαθηματικὴ ἀκριβολογία.* He might, we think, have made out even a stronger case than he has done against the systematic metaphysicians. He accuses them of holding Aristotle's theory of *ἐπιστήμη* in an age when it is no longer merely *naïf* to do so. But it is surely true that they have perverted the theory by giving an extended sense to ἐπιστήμη, which Aristotle practically limits to mathematics. We do not wish to be thought ungrateful to a book so full of suggestions as the present; but we cannot help expressing our regret that it does not go into the subject of Aristotle's theory of the method of geometry. His theory, which has not received the attention which it deserves from his commentators, interesting independently, seems to us to gain a special interest when viewed in connection with Lange's remarks on Formal Logic, of which Aristotle is the author. But before attempting to supply this omission, we must state Lange's view of the nature of the apodeictic in Formal Logic, and his criticism of Aristotle's view on the subject.

Kant showed that mathematical judgments are synthetic *à priori*, but maintained that logical propositions are analytic, implying the Principle of Contradiction. But all apodeictic truths are synthetic. Mathematical truths are syntheses *à priori* by means of the intuition or perception of Space. Logical truths are syntheses *à priori* by means of the same intuition (pp. 8, 9). As the necessary deductions of mathematics are derived by the way of self-evident sight from the immediate perception of the simplest geometrical shapes, into which the less simple diagrams are broken up—these simplest shapes being, as Kant expressed it, perceived in pure intuition; as Dugald Stewart expressed it, hypotheses; as Lange expresses it, variable in imagination within the limits of a notion (pp. 22, 28, 47),—so, too, the processes of Formal Logic derive their necessity from the perception of figures in Space which are immediately seen to include totally or partially or to exclude other figures. This immediate perception is the only ground of the apodeictic. Even the Principle of Contradiction itself reposes on this ground, and its mechanical employment in Reduction must not be allowed to mislead us as to the ultimate ground of the apodeictic in that process (pp. 26, 27). Similarly we can manipulate numbers mechanically in counting (p. 21); but the small numbers which are our ἀρχαί in arithmetic are originally given in space-intuition (p. 141). Aristotle's logic is, however, essentially one of intension—τὸ A κατηγορεῖται κατὰ τοῦ B. But this comes from his metaphysic. A is of the *essence* of B. The modern friends of the Aristotelian metaphysic who regard it as the 'apodeictic science' *par excellence*, attempt to exhibit it as the ground of the apodeictic in his logic also. But although doubtless in Aristotle metaphysical forms enter largely into logic, yet there is a marked difference, ignored by his modern followers, between his *Technik* and his *Erkenntnisstheorie*. Although the metaphysical theories of essence and of δύναμις and ἐνέργεια play an important part in his analytic, and although his logic may be therefore styled one of intension, yet he does not ground its necessity on metaphysical principles but on the exhibition of the extent of notions—*i.e.*, on the intuition of Space. Hence his logic has a value quite independent of that of his metaphysic (pp. 10, 17).

The Syllogism, Lange points out, obliges Aristotle to abandon the metaphysical theory of intension in favour of that of extension. Instead of τὸ Α κατηγορεῖται κατὰ τοῦ Β we have ἐν ὅλῳ τῷ μέσῳ κ. τ. λ., where the apodeictic is evidently based upon the immediate perception of circles or some such representative figures. He gives no *proof* of the First Mood of the First Figure. He regards it as self-evident that if C is wholly in B and B wholly in A, then C is wholly in A (p. 21). This substitution of extension for intension noticed by Lange in Aristotle may be paralleled in Mansel's *Prolegomena Logica.* When treating of judgment, Mansel takes an attributive view of predication, but the *dictum de omni et nullo* afterwards obliges him to interpret propositions in extension. It would be going too far however, Lange admits, to suppose that Aristotle consciously recognised in spacial representations the ground of the necessity of the moods of the First Figure. But it is significant that he considered them the most perfect moods and reduced the others to them. Even in his theory of predication, however, Lange finds evidences of space-intuition. Circle S is moved into circle P on Lange's theory. Aristotle moves P to S—ὕλη is actualised in an individual (p. 11). This reconciliation is far-fetched, we think. There is little analogy between movement in space and 'movement' from potentiality to actuality. The Aristotelian theory of predication, as such, cannot, we think, be represented by figures in space; it is only when the proposition becomes the premiss, or when he converts it, that Aristotle interprets it in extension—as Ueberweg (*Logik*, § 84) remarks: "The possibility of making the predicate substantive is a tacit pre-supposition (in conversion) but is not farther discussed". To "make the predicate substantive" is to view it as a class of things occupying a definite space. But Aristotle did not realise the fundamental importance of this view to Logic as an apodeictic system; though it unconsciously dominates his *Technik.*

Lange, however, does some injustice to Aristotle in ascribing his reading of predication in intension entirely to his metaphysical presuppositions. Aristotle's theory of predication was really a protest against metaphysic or the dominion of mere words. Because Antisthenes the Cynic believed that every word stood for a thing or substance, and that one substance could not pass into or become another substance, he denied entirely the possibility of predication; and for exactly the same reason Plato, who wished to show the possibility of predication, had recourse to his myth of the μέθεξις of the individual in the separate essence of the Idea. That the doctrine of Ideas was closely connected with the difficulty about predication is a view supported by the fact that Antisthenes and Plato were bitterly opposed, and that the former wrote a work called Σάθων ἢ περὶ τοῦ ἀντιλέγειν against the Ideas. (See Mullach, *Fragm.* Vol. II., pp. 270, 282.) In the *Metaphysics*, Aristotle can scarcely be said to have seized the altered point of view regarding predication necessary to an effective criticism of the Ideas. Μέθεξις merely becomes the passage from δύναμις to ἐνέργεια. The difficulty is antedated but not removed.

But in the *Categories*—whether or not the version we have is directly Aristotle's, does not make much difference here, we think—a new point of view is gained : the Noun is distinguished from the Adjective. 'Man' looks like a noun, but is really an adjective. It is an aspect of 'this man' : *ἐπὶ δὲ τῶν δευτέρων οὐσιῶν φαίνεται μὲν ὁμοίως τῷ σχήματι τῆς προσηγορίας τόδε τι σημαίνειν, ὅταν εἴπῃ ἄνθρωπος ἢ ζῶον· οὐ μήν γε ἀληθές· ἀλλὰ μᾶλλον ποιόν τι σημαίνει* (*Cat.* 3). 'Man' is an adjectival noun or common term connoting attributes and denoting individuals, and as such it is distinguished by him in this passage from a simple adjective like 'white' which has merely connotation. Even in the *Metaphysics* this point of view seems to be seized in at least one passage—*Met.* vi. 14 : *ἰδέαι ἅπαντα ἐξ ὧν ἄνθρωπος*—all the various aspects or qualities of man will, on Plato's theory, be separate Ideas. The importance of the Aristotelian theory of Categories then is that it draws once for all a distinction destructive of the Platonic and many other word-mythologies.

We have thus attempted to trace the history of the Aristotelian theory of predication as attribution in order to substantiate our remark that Lange is not quite fair to Aristotle when he connects that theory entirely with his metaphysical pre-suppositions. Aristotle's new theory of predication was a most important advance in the struggling science of Grammar, or the art of clear thinking. It was a contribution to the possessions of the human race quite as valuable as his *Technik;* and so far, we can only admire the inconsistencies which Lange has pointed out in the Aristotelian logic. With regard, however, to the undoubtedly metaphysical elements in Aristotle's logic, Lange's remarks are, we think, most valuable. Aristotle's great error, he says (p. 33), was to transfer subjective elements to things—*e.g.*, Possibility and Necessity, and in this way his formal *Technik* was seriously affected. With regard to Possibility—*we* can now say that the sight of the acorn suggests the *thought* of the oak ; but the thought does not alter the acorn which is still an acorn (p. 37). We can dispense with the category of Possibility. But Aristotle's conceptions are destroyed by being explained in modern phraseology. His *Weltanschauung* was entirely different from ours. We, believing in the necessity of natural causes, may explain the *δύναμις* as "some of the conditions of a thing" and the subjective uncertainty of its actual development. But this was not Aristotle's view (pp. 38, 39).

Again, (p. 84) his view that the *μέσον* ought to be the 'real cause' is a piece of Platonism. He ranked Induction so low that he did not see the scientific importance of the conclusions of the Third Figure, and gave an inferior place to *συλλογισμοὶ ἐξ εἰκότων καὶ σημείων.* But modern discoveries have almost universally been made by *media* which have not been the 'real causes' (p. 89). Even mathematical proof in many cases does not take the 'real cause'—*e.g.*, where the method is apagogic, or where one construction is preferred to another merely on account of its greater clearness (p. 90). With regard to these *Hülfsconstructionen,* we may say in passing that we think Lange is scarcely correct in calling them *media* at all. They are merely conventional mechanical ways of breaking up difficult diagrams into their simple spacial elements. These elements are our *media* or *ἀρχαί.* Our conclusions are the development of their assumed or seen properties, and they may correctly be described as the 'real causes' of these conclusions. However, notwithstanding his theory of the 'real cause,' Aristotle, as Lange well points out (pp. 85, 86), gives few examples of syllogisms in which the *μέσον* is the 'real cause,' and yet his examples are formally correct. Here again his *Technik* asserts itself as something distinct from his metaphysic. The intuition of Space then is the ground even of ancient Logic; and modern Logic, with the same ground consciously or unconsciously taken, develops itself in two—we in England may suppose—opposite directions. Figures in Space necessitate the view of the universal as a *collection* of resembling individuals. The Aristotelian *τίς* which is distributive has given place to the modern *some* or *at least some*, (pp. 70, 72) which is collective. Thus the logic of Figures in Space connects itself with modern Induction. It also exhibits Logic as deriving its apodeictic character from the only fountain of the apodeictic—the intuition of Space, and thus makes it an integral part of the new Kantianism.

We must pass over, with bare mention, many interesting points of detail raised in the *Logische Studien*—*e.g.*, the practical value of the different Syllogistic Figures (pp. 80, 81); the proof by diagrams of conclusions not allowed by the Aristotelian Logic (p. 83); the relation of the Particular Judgment to Induction (p. 57); that the apodeictic judgment is not more necessary than the assertory (pp. 41, 92); that contrary opposition is extralogical (p. 107); on the 'intuitions' of the Logic of Probabilities—coins, dice, balls—which give it its apodeictic character (p. 114). We must pass over these and other points, and proceed to give our reasons for believing that the derivation of the apodeictic from the intuition of Space was not so strange to Aristotle's mind as to exclude the likelihood of his having consciously based some part of his *Technik* upon it. We must remember that Aristotle was the *inventor* of Formal Logic, and was therefore more likely than Kant, who received it by tradition, to understand the real ground of its necessity.

The geometer's *ἀρχαί* according to Aristotle are the simple figures, *e.g.*, triangle, (*An. Post.* ii. 7,) the definitions of which he assumes. These figures are *δι' ἀφαιρέσεως*—abstract, and their real nature is comprehended at a glance—*τὸ τί ἐστιν οὐκ ἄδηλον* (*Eth.* vi. 8, 6). In *Met.* ii. 3 he derives the necessity of mathematical proof from the abstractness of its objects—*i.e.*, from their plainness at first sight: *τὴν δ' ἀκριβολογίαν τὴν μαθηματικὴν οὐκ ἐν ἅπασιν ἀπαιτητέον, ἀλλ' ἐν τοῖς μὴ ἔχουσιν ὕλην.* Geometrical proof consists in breaking up a difficult diagram into simple figures, the spacial properties of which we can take in at a glance—in drawing lines which enable us to *see* the demonstration. *Met.* viii. 9: *εὑρίσκεται δὲ καὶ τὰ διαγράμματα ἐνεργείᾳ. διαιροῦντες γὰρ εὑρίσκουσιν· εἰ δ' ἦν διῃρημένα, φανερὰ ἂν ἦν·*

νῦν δ' ἐνυπάρχει δυνάμει. διὰ τί δύο ὀρθαὶ τὸ τρίγωνον; (Eucl. i. Prop. 32.) *ὅτι αἱ περὶ μίαν στιγμὴν γωνίαι ἴσαι δύο ὀρθαῖς. εἰ οὖν ἀνῆκτο ἡ περὶ τὴν πλευρὰν ἰδόντι ἂν ἦν εὐθὺς δῆλον.* The geometer's circle is seen or imagined by him as it really is, and is therefore the essential source of his necessary demonstrations of its properties—*τὸ κύκλῳ εἶναι καὶ κύκλος τὸ αὐτό* (*Met.* vi. 10). If we remember that Geometry was to Aristotle *the ἀπόδειξις par excellence*, and that the *ἀρχή* or simple figure seen or imagined is seen or imagined in its naked essence, his theory of the 'real cause' in *ἀπόδειξις* will not appear so metaphysical as Lange represents it to be. Mathematical truths then according to Aristotle derive their universality and necessity from the plainness with which we can imagine the elementary figures always in exactly the same way. His theory is that afterwards advanced by Dugald Stewart; and it does not seem to differ essentially from Kant's. Kant's 'pure intuition'—perhaps too severely criticised by Lange (pp. 132, 3)—is after all a name for the power we have of imagining perfectly regular figures. As Lange indeed admits—Kant seems to include Imagination under Intuition, and it is through Imagination that the theorems of geometry and logic obtain their necessary character (p. 131).

Space then is the source of the *à priori*, and whatever science can be connected even by conventional and arbitrary assumption with Space-intuitions, becomes apodeictic. Formal Logic deals with objects generally, Geometry with the shapes and sizes of objects, and Arithmetic with the sums of equal objects. Time is derived from the perception of movement in Space (p. 147). Here the theory might be supposed to end naturally. But it is in Lange's manner to give his reader the metaphysical sensation of a wide and solemn prospect from the scientific eminence to which he has conducted him. Why is Space the fountain of the Apodeictic? Because it is the intuitional form of my Ego (pp. 137, 8). The ego which by association of ideas connects itself with my bodily states is not the ego of knowledge—the subject to all objects, my bodily self among the rest. There is an empirical distinction between the bodily self and the so-called outer world; but this merely empirical distinction has been transferred by a confusion of thought to the absolute ego, the subject which is never object, which is thus distinguished from the non-ego. Thus to distinguish it is to enter upon the path of baseless speculation. The only content of the absolute ego—the subjective pole of Knowledge—is the great totality of the World as perceived in Space (p. 138); for this transcendental ego (p. 148) is nothing but the entirely unknown counterpole of objective perception. The bodily self is one of its objects in the world of appearances which is our experience and our all. But as the empirical or bodily self is developed, great part of experience is opposed as something foreign and external to what we suppose to be ourselves—the bodily self. Thus Space also becomes apparently foreign and external to us; and yet it is the norm of the operations of the understanding, which on account of their universality and necessity must be determined by the constitution of the Subject. Kant (pp. 135, 6) held that Synthesis—the unity of the manifold—comes from the Subject. But it may well be that it is through this Synthesis that the empirical and conscious Subject first emerges, and with it necessarily also the Object of its consciousness. In the perception of Space we have the archetype of this fundamental Synthesis. Hence it is through it alone that all syntheses are possible. We cannot explain this unity of the manifold, but we can *see* it represented in Space. Here we feel the secret of Lange's style. A technical discussion brings us upon what we ventured to call a wide and solemn prospect. To think that the measureless space which I see is the archetype of myself! A shudder runs through the literary nervous system not unlike that which runs through the physical when one looks over a precipice.

J. A. STEWART.

Modern Philosophy from Descartes to Schopenhauer and Hartmann. By FRANCIS BOWEN, A.M., Alford Professor of Natural Religion and Moral Philosophy in Harvard College. London: Sampson Low & Co., 1877.

PROF. BOWEN says, in his preface, that it has not been his "purpose to write a complete history of modern philosophy," and that he has aimed at being something more than a commentator, holding it to be "a duty frankly to avow and earnestly to defend the whole doctrine which appeared to him to be just and true". How far his work is from being a complete history of modern philosophy may be indicated in his own words:—

> "I have said little about Hobbes or Locke, Hume, Reid, or Hamilton whose writings are accessible to all, and who ought not to be studied by thoughtful and earnest inquirers at second hand. But the great names of Descartes, Spinoza, and Malebranche, of Leibnitz and Kant, of Fichte, Schelling, and Hegel, are little more than names with most English students," &c. *(Preface.)*

Our author cannot mean that the works of Descartes and Kant are inaccessible to the thoughtful and earnest inquirer, nor that such a personage may rest content with second hand knowledge of them; so that it is difficult to find in the above passage a reason why, in a volume which discusses Descartes and Kant pretty fully, Locke and Hume are almost unnoticed. Whatever be the case in America, the English public in these islands is calmly indifferent to the accessibility of Hume, and I believe the British student gives as much or more attention to Kant. The omission is the more noticeable because a whole chapter is devoted to Berkeley, whose works may also be called accessible, and deserving the personal application of an anxious inquirer; especially noticeable because Berkeley's historical importance must, in spite of his great discoveries, be considered less than Locke's or Hume's, since the influence which he might otherwise have directly exercised upon philosophy was presently, for the most part, absorbed into

Hume's. And Hume's influence was so great that how a student unacquainted with his doctrines can be made to understand Kant, is itself a matter not easy to understand.

As to the other side of the book, on which the author appears as something more than a commentator, its characteristics, too, may be indicated by a quotation from the preface :—

> "Earnestly desiring to avoid prejudice on either side, and to welcome evidence and argument from whatever source they might come, without professional bias, and free from any external inducement to teach one set of opinions rather than another, I have faithfully studied most of what the philosophy of these modern times and the science of our own day assume to teach."

Thus disclaiming prejudice, he continues, not without a trace of emotion :—

> "And the result is, that I am now more firmly convinced than ever that what has been justly called "the dirt-philosophy" of materialism and fatalism is baseless and false."

He then declares himself a Christian ; and accordingly the work is to a great extent apologetic from that point of view.

It occurs to me to ask what that "professional bias" can be which is mentioned in the above quotation. Is it possible that, as American students sometimes assert, a "*Universitäts-Philosophie*," such as stirs the indignation and darkens the prospects of Radicals on the European Continent and is not without example amongst ourselves, exists even in the land of the free ? This question was suggested by the first sentence of our author's account of Schopenhauer (chap. xxi.), where he says that he had hesitated long before introducing any account of Schopenhauer's writings into this work. "To analyse them, even for purposes of censure and refutation, seemed too much like promoting the dissemination of evil." For this is just the attitude of mind which the great pessimist ascribed in an exaggerated form to the German professors of his day. And then one could not help wondering whether a dread of disseminating evil had suppressed a chapter on Hume ; though, of course, on remembering that other reasons, however unsound, had been given in the preface, the wonder subsided.

Since now this work has avowedly two aspects, it will be well to consider it in both—first as a history of philosophy, and then as a contribution to philosophy. And since as a history it contains no ambitious theory of how philosophy must necessarily have grown and developed, our task under this head will be to examine, as well as space permits, how far the exposition is impartial and trustworthy. But before entering upon a course which may perhaps lead to fault-finding, it may be said at once that the book is always readable. Very few books of the sort are as little likely to make a beginner think philosophy harsh and crabbed ; and so, if it is not altogether satisfactory itself, it may do good service by inducing its readers to pursue the subject elsewhere.

In an interesting chapter on Descartes, the author finds that—

> "The great defect of the Cartesian philosophy is, that it takes little notice of the idea of cause, and does not disentangle or present to distinct consciousness the great law of causality, though the whole system unconsciously pre-supposes the validity of this principle, not only as a law of thought, but also as a law of things" (p. 30).

And he charges Descartes with confusing "the relation between substance and attribute with that between cause and effect". By the law of causality, Prof. Bowen, I believe, does not mean the law of phenomenal antecedent and consequent, but a law expressing the necessity of an efficient noumenal cause. But in any sense it can hardly be maintained that Descartes' system only unconsciously presupposes such a principle. For although in the *Discourse on Method* it is not so explicitly stated as could be wished, it elsewhere has due prominence given to it. In the *Principles of Philosophy*, I. § 49, the axiom *ex nihilo nihil fit* is stated first in a list of eternal truths; and in II. § 36, Descartes says that it is intuitively evident to himself that God was the first cause of motion, having created matter with a certain quantity of motion and rest, which He has since preserved unchanged, thus manifesting His own unchangeableness; and he then goes on, in §§ 37-8, to state the first law of secondary causes, and to illustrate its quantitative aspect in the case of projectiles. The point appears important to Prof. Bowen, because he says that Descartes' expressions on this subject led to Spinoza's Pantheism, of which he has the deepest horror. But Descartes, when using the strongest expressions, as when he says that God upholds the world by the same action by which he originally created it, is careful to add that this view has the general sanction of theologians (*Discourse*, Pt. 5). It cannot be denied, of course, that the relations of the attributes to substance in Spinozism is derived from the relations of the three substances—the dependence of mind and matter on God—in Cartesianism; but that Descartes adopted this conception immediately from the current theology is equally indisputable. And the difference between Spinoza's and Descartes' views is not less obvious than the derivation. For Descartes conceives of God in relation to mind and matter far less frequently as the substance of substances, than as the cause of effects; in so far, of course, as cause and substance are transcendentally distinguishable.

The tone of the chapter on Spinoza, elsewhere called "the remorseless Jew," and "the infidel Jew," seems to me unfairly disparaging; too much is made of his indebtedness to Descartes as a thinker; and his "irreproachable character" is accounted for by his having wanted the physique of a healthy sinner; "leading the life of an anchorite, not from principle or by any effort of self-denial, but simply for want of liking for the ordinary enjoyments of mankind". That ill health and virtue naturally go together is, however, contrary alike to reason and experience; it is not every invalid of whom it can be said that "he conciliated not only the goodwill, but even the strong affection of the few ordinary persons with whom the seclusion of his life allowed him to come in contact" (p. 60). Prof. Bowen's account of

Spinoza fails, like many others, by regarding him chiefly as a metaphysician, and almost forgetting that he was a moralist. Has any one explained why the *Ethics* of Spinoza has nearly always been treated as a volume of metaphysics? Is it that critics have not had patience to read far enough, or that dislike of the heretical metaphysician has made them willingly forgetful of the saintly moralist, or that the nature of substance and attribute is so supremely interesting to mankind that the conduct of life is comparatively unimportant? There are several mistakes in Prof. Bowen's chapter. Speaking of Spinoza's system as dependent on definitions, he says:—

> "Spinoza has no right subsequently, at the conclusion of his philosophy, to pass from his ideal distinctions to the world of real things, and take for granted that he has proved human beings and other finite existences not to be substances *in any sense—i.e.*, not to be realities—because he has shown that they are not substance in his sense" (p. 63).

But, in the first place, reality and substance are not synonymous, and Spinoza does not deny the reality of finite existences "in any sense": they are real to him as Modes of the Attributes of God. And, secondly, Spinoza does not take for granted the passage from his ideal distinctions to the world of real things at the conclusion of his philosophy; but, quite early in the *Ethics* (Pt. II., Prop. 7), supposes himself to prove that the order and connection of ideas and of things is the same. Again, describing the necessity of natural law according to Spinoza, our author writes:—

> "Every volition even, every act of a conscious agent, is preceded by certain states of mind, all involuntary, on which it is necessarily consequent; and these mental states are the inevitable results of physical changes in the world without," &c. (p. 70).

But Spinoza says (*Ethics*, Pt. III., Prop. 2), the Body cannot determine the Mind to thought, nor the Mind the Body to motion. I must admit that in the last paragraph of the chapter (p. 72) Prof. Bowen shows himself aware of the truth on both points. But an historian cannot atone for having stated something wrongly on one page by stating it aright without any reference on another.

After a chapter on Malebranche we find one on Pascal: and our author's reason for giving so much space to one who is not usually regarded as marking an epoch in philosophy, is that he was the true originator of the "Philosophy of the Conditioned," which became a favourite doctrine with Hamilton. This is especially important, he thinks, because Mill attributed Hamilton's difficulties in dealing with the conception of Infinity to his ignorance of mathematics, whereas here we have them in Pascal, one of the greatest mathematicians. It *is* a little surprising that although Hamilton, when trying to show that his doctrine was as old as Philosophy (*Discussions*, Appendix I.), quotes from Pascal, he nowhere refers to one or two passages produced by Prof. Bowen (*Pensées*, Art. II.) which would have been much in point. It does not, however, surprise me that Mill did not notice them: for if I have the right passage (the almost total absence of references is a grave defect in this book) the particular difficulty which he attributes to Hamilton's ignorance of mathematics lay in conceiving how one infinite could be less than another (*Examination*, p. 536, 3rd ed.); and these difficulties are not those which Hamilton may have taken hint of from Pascal. I regret to add that Prof. Bowen ascribes to Hamilton a mistake in the statement of his doctrine which was not one of those that he fell into: he represents him as supposing the infinitely great to be the contradictory of the infinitely small (p. 94). When Prof. Bowen has dissipated this illusion by re-perusing Hamilton's sixth Lecture on Logic, he may consider whether he has not himself fallen into a very similar error in attempting to state the doctrine at p. 93. It is a doctrine dear to him; for, "of course," he says, it "is destructive of Empiricism. All the space of which we have had experience, either through the senses or by the imagination, is finite or limited." Astounding! No tidings that ever reached us from the New World have so stimulated our curiosity to visit it. The boundaries of space are there the most familiar objects of contemplation. This must give the inhabitants an unfair advantage over Europeans in philosophising on the subject.

In the chapter on Leibnitz we read that the Monadology was "in the main a deduction from the doctrine of Innate Ideas, and from the Principles of Sufficient Reason, &c.," but whoever turns to *La Monadologie*, § 7, must perceive that the doctrine of Innate Ideas is an immediate deduction from the nature of Monads.

In the chapter on Berkeleyanism, Professor Bowen takes occasion to denounce the "monstrous Egoistic Idealism, or Solipsismus, of Fichte, J. S. Mill, and the Positivists, who by denying both substance and cause, thereby deny the existence of any Non-Ego," &c. (p. 150). Dismissing the Positivists as an indefinite group of persons who, if really guilty of such incredible inconsistency, are justly to blame, it may be observed with reference to Fichte that to deduce is to establish, not to deny; and that the Non-Ego, cause and substance were, as he supposed, deduced in his system. Fichte did not, indeed, attribute original reality to the Non-Ego; but he was not singular in that; no one who believes in an Absolute Being, under whatever name, can attribute original reality to another. Surely it was enough that the Non-Ego was, for Fichte, necessary to the Ego's self-consciousness, and thereby necessarily partook of its absolute reality. Does any orthodox theologian venture to ascribe more reality than that to all creation? Similarly of Mill: he did not deny the existence of either substance, or cause, or Non-Ego; but only endeavoured to analyse them into their simplest elements, and to find expressions for them in accordance with the principles of a particular school of philosophy. Such a sentence as the above suggests that the writer has not mastered either the expressions or the ideas of any school but his own.

He might at least have been careful in little matters; but he cannot be trusted to state correctly the smallest detail. The form of Kant's *Prolegomena*, he says, is synthetical (p. 158): that it is analytical Kant himself takes the trouble to tell us in his preface. The whole of

Vol. III. of K. Fischer's *History of Modern Philosophy* is, he says, devoted to the *Critique of Pure Reason* (p. 160): only half of it is so devoted. Professor Bowen himself has five chapters on Kant, of which it can only be said that they are well worth correcting. Perhaps the best chapters in the book are the three on Schopenhauer: the worst is certainly that on Positivism.

After a ludicrous introduction, in which we read that a reaction "has brought back in all its essential features the philosophy of the eighteenth century;" that Mr. Darwin "repeats Helvetius and Lord Monboddo"; that Mr. Spencer "develops at great length the noted hypothesis of Condillac;" that Prof. Huxley's sensible wish to be wound up every morning "to think what is true and do what is right," was such as "a Danton or a Desmoulins might have uttered while projecting the September massacres" (p. 261):—after this, we find Positivists distinguished into the disciples of Comte, and a group of thinkers who, our author says, are really disciples of Hume. From the account of Comtism proper take this choice sentence: its theology "inculcates the systematic worship of that gigantic idol representing humanity at large, or the whole human race, which Hobbes of Malmesbury called 'the Leviathan,'" &c. Perhaps that is enough. For the outer Positivists, really disciples of Hume, Professor Bowen takes J. S. Mill as their type, and associating with him Mr. Spencer, Mr. Lewes, Mr. Darwin, Profs. Helmholtz, Huxley, and Tyndall, empties his quiver at them indiscriminately. It would be well to re-write this chapter, or omit it altogether, from another edition.

We must now try to summarise Prof. Bowen's own views. He holds that our ideas of substance and cause are given in the self-consciousness of the Ego. In volition we are immediately conscious of originating force; and since matter and motion are reducible to forces, and these forces to one, we must infer that this also is the manifestation of a Will. Our author is a staunch upholder of Free Will; and the idea of invariable natural law determines him to strong language: "If one could believe it—thank God that I do not!—it would drive him to suicide" (p. 71). It may be inferred from many indications that these chapters were originally lectures.

Innate ideas (which, with the testimony of consciousness, play a prominent part in our author's reasoning) are to be known by the mark of universality and necessity: but whether he holds that what is inconceivable is non-existent or absurd, cannot be clearly ascertained. For at p. 59 we read:

> "I accept, therefore, the doctrine of Pascal, Hamilton, and Mansel. There is an absolute necessity, under any system of Philosophy whatever, of acknowledging the existence of a sphere of belief beyond the limits of the sphere of thought."

But when at p. 67 it becomes desirable to overwhelm Spinoza, we read:

> "It (Spinoza's system) annihilates both God and the universe, by resolving both into the inconceivable abstraction of a universal Substance, which is to us, because inconceivable, a nonentity."

Prof. Bowen, in all his encounters with Empiricists and Positivists, never explicitly refers to the Association of Ideas until p. 448, in the last chapter but one (on Hartmann); and there he seems to think that Memory is better explained by the agency of "The Unconscious" —seems, I say; for indeed, whilst reading such a book, one begins at last to doubt the testimony of consciousness. Of inherited experience he can never have heard: for, at p. 270, he quotes from Mr. Spencer: "'The gradual accumulation of experiences, however, and still more the organisation of experiences'"—and adds—"that is, we suppose, the progress of Science". He might have learnt better from *Cosmic Philosophy*, the meritorious work of his countryman, Mr. Fiske. Illustrating the view that we know universals before particulars, by the growth of language, he says:

> "Every object that the young child sees is *thing—something;* next, it knows *hard things* and *soft things;* next, *wood*, *iron*, and *stone;* next, *tables*, *chairs*, *clocks*; and last of all, *papa's own arm-chair.*"

If this were true, we might surmise that that Stoic who, dissatisfied with τὸ ὄν as the Summum Genus, superseded it with τὸ τί, adopted the idea from his baby. But it is not true of British babies, nor perhaps of any, unless their minds have been precociously and perversely developed by being confronted on every hand with the limits of space.

On the whole it must be said that Prof. Bowen's erudition is deficient in accuracy and perception, and probably a little one-sided. The errors noticed above are not a tithe of what could be produced from his book; and some of the sins of commission imply that the sins of omission are not without their own sufficient reason. Occasionally, too, in his pages we meet with words of aspect strange. If Prof. Bowen would rather be called a "speculatist" than a thinker or philosopher, perhaps he is right; but he ought not thus to nickname others unless he is sure they would like it.

CARVETH READ.

Thoughts on Logic; or, *The S,N,I,X, Propositional Theory.* London: Trübner, 1877.

IN this anonymous little essay an attempt is made to work out a new and comprehensive theory of the logical proposition. The principles from which the author starts are the following: (1) That the proposition expresses affirmatively some relation between two objects regarded as totalities; (2) that the objects as totalities are the subject of the proposition, while the predicate is the special relation affirmed to exist between them; (3) that all relationships are reducible to the four of Substitution, Exclusion, Inclusion, and Intersection, symbolised by the letters S,X,N,I. He endeavours to show that these relationships contain all that can be expressed in judgments, that they simplify the doctrine of inference, and that they obviate many of the difficulties inherent in the ordinary doctrine of the proposition. It must be specially noticed that in order to make his theory workable, the author is compelled to put a quite peculiar meaning upon the logical symbol *some*. He thinks *some* is used in two senses, as a specific or particular some, and as the sign of partition, in which case it is equivalent to *some only*. It is difficult to understand what is meant by some as a specific quantity, especially as the author seems to think that when so employed it is equivalent to a universal. In no sense whatever is this the ordinary logical doctrine. According to it, *some* is always indefinite and equivalent to *some at least, it may be all.*

Substitution, Exclusion, Inclusion, and Intersection are the well-known relations between notions or concepts in Extension. When applied to judgments, even if the view be admitted that the judgment does express relations of classes, it is easily seen that they are far from being simple. In point of fact they are highly complex, and to be of service at all in the process of inference require to be expressed in the propositional forms of the old and new Analytic. Take for example Inclusion, ρ includes δ. The full meaning of this thought, as the author himself admits, is—All δ is only some ρ, Some ρ is not δ, and when we infer we are invariably employing one or other of them. So too the Intersective relation, δ intersects ρ, is not a simple thought but highly complex. Strictly analysed it yields Some δ is some ρ, Some δ is not all ρ, Some δ is not some ρ, Some ρ is some δ, Some ρ is not all δ, Some ρ is not some δ. A further judgment which, according to the author, is given in Intersection, *viz.*, that of inclusion between each total class and a part of the other, is merely an illustration of the ambiguity attaching to the word *all*. In true logical judgments *all* is distributive; in the supposed judgment of Inclusion it is collective.

We object then to the proposed classification of judgments on the ground that the relations affirmed are complex and must be expressed in the ordinary propositional forms before they can be applied. This objection would hold good, even if it were admitted that the logical judgment does express relations between objects thought as wholes. But such a definition of judgment, practically identical with Hamilton's view, seems far from satisfactory. Does it throw any light on the nature of the relation between subject and predicate in the judgment *some flowers are white*, to say that this is equivalent to *flowers and white objects intersect?*

Apart from the main idea of the book there are certain minor points open to discussion. The particular meaning put upon *some* and the use of *some only* as a simple symbol seem to us erroneous. *Some only* really yields a double judgment, the I and O of the Aristotelian logic. The relation of Substitution is a most perplexing one. It is, according to the author, both extensive and intensive. Now in a judgment of extensive substitution, can it be said that we affirm a relation between *two* objects? There is only one object. Substitution, as the writer seems to grant, is only denominational. But he also advances a peculiar doctrine as to particular intensive substitution, which we have the greatest difficulty in comprehending. The example given (p. 63): "Non-lovers of Turkish rule include Gladstone; non-lovers of Turkish rule include Carlyle; ∴ certain Gladstone and Carlyle substitute"—throws no light on the matter. Indeed the writer is throughout far from clear with regard to intension. Holding that all relationships are reciprocal (*e.g.*, if A substitutes B, then B substitutes A), he maintains that in Inclusion the reciprocal relation is that between intensions. Now, either he has a doctrine of intension entirely at variance with ordinary logic, or he must solve the question whether an intensive judgment can be quantified. If one reflects on the meaning of intension, one readily sees that it cannot possibly be quantified. *Some humanity*, *e.g.*, is quantified only in words: a few of the attributes making up humanity is not logically equivalent to *some humanity*. Hamilton himself never attempted to apply his doctrine of quantification to the so-called comprehensive judgment. When we attempt to throw a particular judgment into intensive form, the perplexity becomes greater. How shall we express *some flowers are white* intensively? It cannot be, as the author seems to say (p. 34), *some white things have the attribute florality*, for here the subject is in extension. Shall we say *some whiteness is florality?* This is doubly absurd. In short the intension of some A is precisely the intension of all A; and the particular extensive judgment has no exact counterpart in comprehension. It may be pointed out in addition that if judgments of the forms All δ is ρ, Some δ is ρ, could be expressed in comprehension, they must be analytic. In no synthetic judgment can it be said that the intension of the subject *includes* that of the predicate.

While giving the author all credit for ingenuity we cannot avoid the thought that his labour has been to a large extent wasted. The relationships insisted on are not simple but complex; when analysed or expressed they yield no results beyond the eight forms of Hamilton's Analytic; and so far as we have tested the forms of syllogism proposed by him, we have only found reason to dissent from those which are distinctively new. The idea of carrying the relations between concepts into the theory of judgment is hardly a novelty: Twesten, for instance, discusses the question and rejects the very four relations here given; and the view of intensive inclusion as the *converse* of extensive inclusion, though not in so many words stated by Hamilton, is found clearly expressed in Spalding (*Logic* § 49).

R. ADAMSON.

VIII.—NOTES AND DISCUSSIONS.

The Genesis of Primitive Thought.—It is somewhat to be regretted that Mr. Tylor, in his interesting notice of Mr. Spencer's *Principles of Sociology* (MIND, No. VI.), has not dwelt more fully on the main points in dispute as to the genesis of primitive thought. While justly claiming that Mr. Spencer's teaching agrees with his own as regards the origin of Animism—certainly a point of great importance, he has scarcely given due prominence, or at least due discussion, to what is most original in Mr. Spencer's account of the growth of the primitive man's conception of nature. In two ways Mr. Spencer is strikingly original: first, in repudiating the ordinary doctrine of a primæval Fetishism—the doctrine that man in his earliest state necessarily ascribed life to lifeless things, and imagined living wills in all objects; secondly, in attempting to explain this habit of vitalising lifeless objects, and all that is commonly named primitive Anthropomorphism, as solely the result of the belief in ancestral ghosts. The deep and increasing interest of the subject prompts me to offer a few remarks on the genesis of primitive modes of thought as viewed under these new lights.

By discarding primæval Fetishism, Mr. Spencer, it seems to me, has made a great advance towards a truer conception of primitive culture than has hitherto been attainable. The doctrine has long been assumed or asserted by anthropologists, but has never been supported by good evidence. For, though the habit of attributing life and feeling to lifeless things is indeed universal among savage and barbaric races at the present day, and prevailed, we may infer, among the early ancestors of all existing races, in all its manifestations it presents the characters less of a primary than of a secondary habit of mind—the source of a system of extra-beliefs superimposed on deeper beliefs, and inconsistent with these though existing along with them. As Mr. Spencer has pointed out, it is incredible that man at any stage should have been ignorant of the distinction between things living and lifeless—a distinction necessary for his self-preservation, and one which almost all the lower animals more or less clearly recognise. Nay, it might perhaps be more reasonable to maintain that the habit of vitalising lifeless agents really depends on a too absolute contrast of lifeless and living things as respectively characterised by inertness and spontaneous motion. Conceiving lifeless things as wholly incapable of self-originated motion, the primitive man could only explain their sudden and life-like actions, when such occur, by attributing to them life and will, or imagining some living entity as acting upon them. If this were so, it is easy to see that the doctrine of souls, by affording a simple and universally applicable means of artificially vitalising lifeless phenomena, would foster the habit to any extent. Some evidence in favour of this view may be found by examining the later developments of primitive philosophy,—such as the doctrines of a Vital Principle and the Lawlessness of Volition—which part the living from the dead or inert by an absolute line. It was left for modern science to remove the hard-and-fast dualism of primitive thought, and demonstrate the identity of vital and physical forces.

Mr. Spencer seems less successful in working out his conception of Animism as sufficient to account for all primitive Anthropomorphism. Most readers will agree with Mr. Tylor that the processes of verbal confusion by means of which he conceives the transformation of ancestor-worship into Anthropomorphism to be effected, afford a very inadequate explanation of the facts. No one can doubt that the belief in souls, though it has not created, has yet greatly fostered the habit of ascribing life to lifeless things; but the chief difficulty now encountered by the students of primitive culture, is to determine what other elements have combined with Animism to produce a mental habit at once so persistent and so unreasonable. Mr. Tylor, who would hesitate to express an opinion that had not been well considered, still, in spite of Mr. Spencer's reasoning, holds by the notion of a direct personifying and myth-making tendency, on the ground that "to both the child and the savage, human will is the first-conceived source and reason of action". To conceive the Sun or the Sky, the Woods or the Rivers, "as great beings acting by will, and able to do good or harm to men," "is the easiest way in which rude minds can contemplate them". It may be objected to this doctrine, that if, as we above supposed, lifeless things are clearly distinguished from living things by the primitive mind, such a fanciful way of conceiving them could not be the easiest way. Even in the rudest mind it would demand an "effort of imagination". Possibly, however, the doctrine of a direct personifying tendency may be reconciled with the denial of a primæval Fetishism, if we suppose that, though the primitive man has no tendency to regard inert bodies as alive, the sudden and seemingly spontaneous motions of many lifeless things will naturally suggest to him the presence of life. Mr. Fiske says primitive Anthropomorphism is simply a corollary from the Relativity of Knowledge: all things known to man are known in terms of human feeling and perception, and, while civilised minds have come to conceive physical forces as mere impersonal pressures and resistances, the natural tendency of primitive minds is to regard lifeless bodies as impelling or resisting one another by conscious effort. This is an explanation having a certain plausibility; but we have already seen cause to discredit any account of Anthropomorphism which represents it to be a necessary and primary mode of thought. Professor Max Müller and others have proved with abundant illustration that Language has had an immense influence in developing Anthropomorphism. Metaphors drawn from the actions of men and animals must, it is obvious, have aided the habit of vitalising lifeless things, if they did not actually give rise to it. So must verbal misunderstandings. On the other hand, there appears no ground for believing with some writers that gender-terminations in names have given rise to Vitalism; much less, that they have descended from a time when all lifeless things were distinguished according to sex. Philologists have shown that genders vary in number in different languages; that their existence is due to mere linguistic accident, and not to any primæval personalising of nature. Some of the Emotions favour the vitalising habit. Affection, dislike, and anger are often called forth by lifeless objects, and may readily suggest a possibility of their being returned. The social instincts in general, and each man's absorbing interest in the doings of his fellow-men, tend to the same result. Indeed, of all possible factors of the personalising habit, probably one of the most powerful is the instinct of *expression-reading*—the well-organised power which all men seem to possess of interpreting human looks and gestures. To this faculty Anthropomorphism gives unconscious exercise. We may perceive how automatically it comes into play, on reflecting how apt we are to discover in lifeless things the semblance of human features.

Whether these suggestions give ground sufficient for a theory of the genesis of all Anthropomorphism and Vitalism can only be determined by further investigation. We may hope in time to understand primitive thought much better than we do at present, for it has a logic of its own, and though very unreasonable is not irrational.*

A. C. OUGHTER LONIE.

* This Note was in type some months ago, but at the last had to be left over from No. VIII. Even if it had appeared in October, its author (as I afterwards learned) would not have seen it, for he had died some weeks before. Mr. Oughter Lonie, whose life was thus cut short, after a lingering illness, at the age of 26, had been a very distinguished student of philosophy at the University of St. Andrews, whence he passed to Edinburgh to make a special study of geology. A career as a practical geologist was opened for him, but he preferred to return to the field of philosophical work. In the new edition of the *Encyclopædia Britannica* he wrote the article on 'Animism,' and the remarks appended to its expository part give evidence of a power of thinking that might have come to much. All those who knew him speak with admiration of his intellect and character, and his untimely fate has blasted many hopes. EDITOR.

Development of the Sense of Colour.—In the October number of the *XIXth Century* Mr. Gladstone has an interesting and very learned paper on the Colour-Sense, in which he endeavours to prove that the Homeric Akhaians had little or no perception of colours as such, but merely a power of distinguishing light and shade. This view appears to me extremely untenable, and I hope at some future time to give reasons on the other side at greater length. Meanwhile, I seize the opportunity kindly accorded me by the Editor of MIND to summarise with necessary brevity the arguments which may be offered against it.

There is every reason to think that the perception of colours is a faculty which man shares with all the higher members of the animal world. In no other way can we account for the varied hues of flowers, fruits, insects, birds, and mammals, all of which seem to have been developed as allurements for the eye, guiding it towards food or the opposite sex. The facts of mimicry, often minutely faithful in every line, spot, hue, and shade—as abundantly illustrated by Messrs. Darwin and Wallace—point in the same direction: for such careful imitation would have been useless unless it aided the mimicking organism in eluding the vigilance of enemies. To come to specific cases, Sir John Lubbock's experiments show clearly that the social insects have a colour-sense essentially identical with our own: while some special instances of their discriminativeness in flowers go far to prove an intensely accurate power of perception. Amongst vertebrates, birds and mammals give many signs of considerable colour-sense, as witness the antipathy of male ruminants to the sight of scarlet, and the readiness with which birds distinguish fruits, &c. How otherwise could we explain the very definite and gorgeously-arranged colours of the peacock, the argus-pheasant, and the mandril? Even among reptiles, Kühne has recently shown * that frogs (unless blinded) exhibit a preference for blue over green glass, special care being taken to exclude all possibility of error through differences of diathermancy, &c.; and it is noticeable that these two colours are the very ones which Mr. Gladstone looks upon as the last to be discriminated. Finally, in the eyes of nocturnal vertebrates, such as owls and bats, we find an absence of certain structures (the cones) which are held to be the organs for the perception of colour, and a presence of certain others only (the rods), which are held to be those for the perception of light and shade alone. But in man and most other mammals, both sets of organs are found, and I believe the nature of their separate functions has seldom been doubted. From these various cases (only briefly selected out of hundreds that might be alleged) we are justified in concluding that the colour-sense is a faculty far more ancient than the development of man, and not (as Mr. Gladstone argues) one but lately evolved.

Again, if we look at the various races of men—since Mr. Gladstone would probably refuse to accept an argument drawn from Darwinism—we shall find very low types of humanity possessing a colour-sense far more acute than that which Mr. Gladstone assigns to the semi-civilised Homeric Akhaians. My own observations on negroes (made in order to test Mr. Gladstone's earlier utterances on the same subject) convinced me that they possess exactly the same sensations in this matter as the ordinary European. They can distinguish in just the same way between primaries, secondaries, and even more delicate hues. A visit to the Ethnological Room at the British Museum will show that the Polynesians, North American Indians, Mexicans, and Peruvians, have or had the power to distinguish red, yellow, green, and blue. Furthermore, to go back in time, the Egyptian wall-paintings, papyri, mummy-cases, &c., are decorated with an infinite number of shades and mixed colours, which reach their highest development under the XVIIIth and XIXth Dynasties (surely quite early enough for Mr. Gladstone), and become less intense and varied at a later date. Among them, the greens, blues, yellows, and their compounds, are especially noticeable for their delicacy and variety. As to the beads, they are almost as beautiful and diversified as those now manufactured for the Central African trade. I think nobody can look at the Egyptian remains in the British Museum—still less at the great collections of fac-similes—without recognising not only colour-perception in a high degree, but also remarkable taste in blend-

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* *Untersuch. aus dem Physiolog. Inst. in Heidelberg*, Band i., Heft 2.

ing and delicacy of hue. On the other hand, chiaroscuro is totally wanting; so that, if we were to argue from the single case of Egyptian painting, as Mr. Gladstone has argued from the single case of Homeric poetry, we might arrive at the diametrically opposite conclusion, that early man possessed a developed colour-sense, but no perception of light and shade.

How then are we to explain the singular fact, which Mr. Gladstone undoubtedly succeeds in proving, that the Homeric ballads contain few actual colour-epithets? In the following manner, it seems to me. Language is at any time an index of the needs of intercommunication, not of the abstract perceptions, of those who use it. Now, in nature, the bright-coloured objects are chiefly flowers, fruits, birds, butterflies, autumn leaves, and other organic products, of little practical importance to the Akhaian warrior. The objects which he needs to describe are earth, sky, clouds, sea, men, arms, cattle; all of them indefinitely coloured, and many of them liable to great changes in light and shade, or great variations between individuals. Hence the need for colour-terms does not practically arise. Again, the growth of colour-terminology seems to me to be greatly dependent upon the art of dyeing, and the consequent use of pigments for human decoration. In our own time, such colours as mauve, magenta, solferino, écru, &c., only come to have names as fashion introduces them into dress: and the vocabulary of artists, house-painters, milliners, and drapers, is much richer in colour-terms than that of ordinary Europeans. So the two words which most express colour in the Homeric ballads are those which refer to the dye of the Tyrian murex and the so-called vermilion. Both of these were probably more or less reddish; and we know from modern experience that reds and purples are the colours which children and savages most admire. I have tried elsewhere to account for this preference: it is sufficient here to note that red seems everywhere the earliest colour used for decorative purposes. On the whole, I think we may conclude that while a loose chromatic sense is to be attached to two or three Homeric words, the majority of visual epithets occurring in the ballads are to be accepted as referring to light and shade alone; because the need for colour-terms was not yet felt among a race of non-manufacturing warriors, and because the gleam of bronze, the light of day, the bright or lowering sky, the indefinite hues of man and horse and cattle, were far more relatively important than the pure tints of flowers and insects, or the almost unknown art-products of Egypt, Phœnicia, and Assyria. As for the range of Homeric colour-epithets, I think it sufficient to note that we ourselves talk of a red sky, red wine, red bricks, a red cow, red lips and red Indians; or of blue heavens, blue sea, blue eyes, blue frock-coats and blue slate.

It will be obvious that I have only given such principal headings as seem indispensable, and have been precluded from further illustration by want of space. But the three points I have tried to make out are briefly these; (1) That colour-perception is a common possession of men and animals; (2) That it is therefore, *a fortiori*, a common possession of all normally-developed men; (3) That the want of colour-epithets in the Homeric poems is due to a defect of language rather than of perception, such as might naturally be expected from the circumstances of their authors. As to the existence and personality of a Homer, that is quite outside the present question.*

GRANT ALLEN.

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* A short notice of the two tracts, by Dr. H. Magnus of Breslau, which called forth Mr. Gladstone's recent utterance on the subject, will be found below under the head of New Books. Prof. Robertson Smith, in a letter that appeared in *Nature* of Dec. 6th, gives brief expression to a view of the question essentially the same as Mr. Allen's (whose Note was independently written some weeks before), and cites a most interesting passage from Athenaeus, *Deipnos.* xiii., 81, which proves that the Greeks themselves were perfectly well aware of the looseness of their poetic vocabulary of colour. EDITOR.

"*Transposition of Traces of Experience.*"—To the process thus aptly designated Mr. Verdon devotes a short paragraph in his valuable article on "Forgetfulness" in the last number of MIND. In each instance of its occurrence, as there represented, we find involved two objects of memory,—(1) a pair of words, syllables, or sounds, and (2) their order in a sentence. The former of these, viewed independently, are supposed to be perfectly well remembered: failure of memory exhibits itself only in respect of the latter. The writer adds that "the whole family of Malapropisms is nurtured upon this peculiarity". Now this general statement may or may not be true in its fullest extent; but before we admit its truth, we must at any rate examine many other typical examples of transposition than those of the exact kind indicated by Mr. Verdon.

At the outset, 'Malapropism' may be referred to a more general 'Maladroitism,' which brings dumb actions within our purview. In fact, the transposition of these is often more striking, and sometimes more amusing, than that of words. Thus a man shall, like Will Honeycomb, be standing by a river-side with his watch in one hand and a pebble in the other: he shall "squirr away his watch" into the water, and shall ("with great sedateness") pocket the pebble. Here the two familiar actions transposed correspond to the two remembered words above referred to, and just as these may be accurately spoken, so may those be accurately performed. But here, and generally, the order of combination is totally *new*,—an arrangement *proposed*, and not formerly learnt. How far, then, and in what sense, is a perturbation of that order chargeable upon failure of memory? Shall we say that an order of procedure is directed by the mind and instantaneously forgotten? or is, perchance, the apparently perturbed order of procedure the one actually directed, while forgetfulness relates to the positions of the objects,—it being momentarily forgotten that the watch lies (say) in the right hand, and the pebble in the left? And what, if those positions have not been accurately perceived? Can that be, strictly speaking, forgotten which has never really been apprehended?

In a certain sense, indeed, we may be said to forget everything but the object on which the mind is, at each successive instant, actually fixed; nevertheless mistakes that fall within the present moment (this being understood to correspond with a material rather than a mathematical point) are generally charged upon want of *attention.* It would seem sometimes, as if the mind, after directing the performance of two actions, instead of superintending the performance, leaves the limbs to act, so to say, automatically; and these excite that action first which, from a nerve-and-muscle point of view, is the more important, or to which the more energetic impulse has been given. Or, again, the operations of the mind being much more rapid than the movements of its material agents, these—the limb, the tongue, the pen—necessarily lag behind, and are continually trying, as it were, to catch it up by leaping to that point in the line of thought to which the mind has preceded them; while the mind is as continually running back to bring them up abreast of itself. When these two movements occur simultaneously the result is some more or less grotesque transposition.

Hence, a general condition of *complete* interchange of two such actions, words, or what not, is that they fall pretty close together,—close, *i.e.*, in time. If hand or tongue lags behind by any long interval, the mind, in reverting to its agent, usually discovers, and if possible rectifies, the first mistake, or at any rate prevents the perpetration of the counterbalancing one. This is nearly always the case in the comparatively slow process of writing. In a rapid succession of actions, moreover, the attention may be forcibly recalled by the oddity or physical effects of the first mistake. Thus, a friend of mine, dressing in great haste, and intending to use his shaving-brush and tooth-brush in succession, dashed the former vigorously into his mouth. Need it be added that he did *not* apply the other to his chin?

But this uncompleted interchange must, in the case of words, be discriminated from a species of Malapropism in which no interchange is either intended or possible; as *e.g.*, when Mrs. Malaprop herself talks of the burning *lather* running down Mount *Vociferous.* Here we step over our bounds into the region of what the Germans call *Volksetymologie*, and find ourselves among linguistic phenomena of the "sparrow-grass" type. A foreign or strange word (never correctly apprehended) is assimilated to a native or familiar one; and then some absurd reason is invented for the special application of the latter.

But purely phonetic interchanges may certainly be embraced under the general process. These, although curtly dismissed by Mr. Verdon, are perhaps more interesting and linguistically important than any others. The accidental slips (for example, with their *h*'s), to which the best-educated people are liable, are indeed mere trifles, and are explicable in the same way as the interchanges above referred to. But in other classes of society real or apparent varieties of such phonetic interchange, which I have elsewhere designated "Cross Compensation" (*Grimm's Law*, Trübner, 1876) have established themselves as dialectic characteristics. Thus the plant-seller that haunts our ways all the summer vociferates "Roots for your gard*ing* all agrow*in* and ablow*in*"; and the lavender girl that follows him sings "sweet-smell*in* lav*ing*der," &c. This class of instances, therefore, offers for investigation not only an origin but a history.*

The object of this note, however, is not (as is obvious enough) to investigate these curious phenomena, so much as to suggest that they deserve investigation. If Mr. Verdon, or some other professed psychologist, would subject them to a thorough discussion, he would, besides amusing himself, instruct inquirers in other lines of study (language, for example) which, without being purely psychological, necessitate a frequent reference to psychological principles.

T. Le M. Douse.

Prof. Jevons's criticism of Boole's Logical System.—The appearance of a new edition of Prof. Jevons's *Principles of Science* shows that his partial adaptation of Boole's system has gained a wider circulation than its original, and renders not inopportune a few words on the two men.

In the preface to this second edition Prof. Jevons says: "As to my own views of Logic, they were originally moulded by a careful study of Boole's works, as fully stated in my first logical essay". So it has seemed best to me to go back to this *Pure Logic* of 1864, and taking his first and last works together, to discuss carefully his criticisms of Boole. In both books one is struck by the fact that Prof. Jevons has never risen from the conception of the old Algebra of Number to the idea of Algebras in general. For him "all the wondrous branches of mathematical calculus" are merely developed Arithmetic (*P. of S.*, p. 162). Yet he appreciates the importance of Descartes' mathematical discovery without noting that it was really making a new Algebra, the Algebra of Geometry, introducing the directed line, the variable, &c., and not being a mere outgrowth from the old Algebra of Number. He mentions also the new Algebra of Quaternions, which contains laws flatly contradicting those of number, yet he does not draw the obvious conclusion. Finally, though Boole's Algebra of Logic is founded on the condition $x^2 = x$ or $x(1 - x) = 0$, which is not true of numbers in general, Prof. Jevons persists in considering it "a numerical system".

What would he say of Grassmann's system, of Mr. Spottiswoode's little paper on Recent Algebras, finally of the Linear Associative Algebras of Prof. Peirce? Are they all the same old original Algebra of Number? As Prof. Peirce says: "Qualitative relations can be considered by themselves without regard to quantity; the algebra of such inquiries may be called logical algebra, of which a fine example is given by Boole". Yes, in spite of Prof. Jevons's continued mistakes on this point, what Boole actually did was to create the first and greatest Algebra of Logic. And now we are able to rate at their proper worth all attempts to "divest his system of a mathematical dress".

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* Many examples may be collected by the student of English popular idioms. A collection from the German dialects has recently appeared in Herr J. F. Kräuter's treatise *Die Lautverschiebung*, pp. 60-62.

From this foundation we are ready to take up in order the objections made by Prof. Jevons to his master's system, and I think we shall see that nearly all of them are mere corollaries of his First Objection, which itself is untenable. It has reference to the old question about the proper method of expressing alternatives. In popular usage, says Prof. Jevons *(Pure Logic*, p. 77), "the meanings of terms joined by 'and' 'or' vary from absolute identity up to absolute contrariety". But, as Mr. Venn says (MIND IV., p. 489)—"The really important thing is to improve upon popular vagueness, by keeping prominently before the mind the fact that there is this ambiguity. This is just one of the things that symbolic language can and should do, and Boole's expressions have the merit of great clearness and precision here. Sometimes what we mean is 'A or B or, it may be, both'; sometimes 'A or B but not both'. These are surely such distinctive meanings that it is a real blemish in common language to merge them together, for we certainly ought to know, in any given case, which of the two we have in mind. This Boole indicates by always using $a(1 - b) + b(1 - a)$ for the exclusive sense, and $a + b(1 - a)$ for the non-exclusive." I perfectly agree with Mr. Venn that Boole is here quite unassailable, yet Prof. Jevons's Second and Third Objections depend directly upon this First, and vanish into thin air with the hook on which they hung.

He words the Second Objection thus: "There are no such operations as addition and subtraction in pure logic," for which statement his proof is that in *his* Logic, which leaves the alternatives indefinite, one cannot safely subtract. This looks like an argument against himself, and is certainly no argument against Boole. Again, acknowledging that "subtraction is valid under the logical restriction that the several alternatives of a term shall be mutually exclusive or contrary," he tries still to uphold the point by saying that the result of the subtraction can be obtained by combination. What of that? In arithmetic the result of multiplication may be obtained by addition. Does that prove that there is no such operation as multiplication in arithmetic?

The Third Objection hangs likewise on the untenable First. Boole found he could make a more perfect system by postulating that each two terms must be logically distinct, and so in his system there was no such thing as what Prof. Jevons has named the Law of Unity, $(A + A = A)$ Making what seems to me a puerile application of this law to a system which expressly excludes it, he says that $x - x$

$+ x$ must not in Boole's system reduce to $+ x$, as it would if it ever could occur there, but by the application of this law (from another system) it must reduce to 0.

The Fourth and last Objection in his *Pure Logic* is also to a certain extent, I think, founded on a misconception. Logic is primarily no more an algebra than chemistry. It was simply a science capable of having an algebra made for it, and so in making the first Algebra of Logic, Boole was called upon to settle once and for all the meaning of the symbols he chose to employ in his system. Very wisely he settled most on the ground of *analogy* to the interpretations adopted in the oldest algebra, and thus $\frac{0}{0}$ received the meaning of '*some*,' an *indefinite class term*. But his critic understands this to mean that wherever $\frac{0}{0}$ appears "we must have another distinct system by which to get that meaning". Two sections before the conclusion of his book he adds: "Supposing it prove true that Prof. Boole's Calculus of 1 and 0 has no real logical force and meaning, it cannot be denied that there is still something highly remarkable, something highly mysterious in the fact, that logical forms can be turned into numeral forms, and while treated as numbers, still possess formal logical truth". This would indeed be highly mysterious if Boole's algebra had no real logical meaning, but the mystery vanishes when we recognise that the algebra which Boole made for logic was subjected to such laws of operation that, had we desired to apply it to numbers, unity and zero would have satisfied all its requirements.

So much for Prof. Jevons's *Logic of Quality*. I will simply add that he transfers the same objections to his *Principles of Science*, 2nd Ed., pp. 68-71, &c., and that they gain no force in the transfer.

In his *Elementary Lessons in Logic* (1870), I will notice only this one sentence, p. 191:—"Dr. Boole regarded Logic as a branch of Mathematics and believed that he could arrive at every possible inference by the principles of Algebra". Here again, Mathematics and Algebra are taken for science of Number; but it entirely misrepresents Boole, to whom Mathematics had a meaning almost as broad as to Prof. Peirce, who scouts the idea that its range is limited to quantitative research. "Mathematics," according to Prof. Peirce, "belongs to every inquiry, moral as well as physical. Of some sciences, it is so large a portion that they have been quite abandoned to the mathematician. Such is the case with geometry and analytic mechanics. But in many other sciences, as in all those of mental philosophy and most of the branches of natural history, it is of no practical value [at present] to separate the mathematical portion and subject it to isolated discussion."

Prof. Jevons himself has had this fact at last forced to some degree upon his attention, for at p. 155 of his new edition of the *Principles of Science*, he quotes this sentence from Boole, which he should have noticed thirteen years ago:—"It is not of the essence of mathematics to be conversant with ideas of number and quantity".

Reading on from p. 155 to p. 162, we may notice that Prof. Jevons's whole doctrine of the nature of Number grows out of his study of the Algebra that Boole made for Logic. He even goes so far as to say,

p. 158 : "I conceive that all numbers might be represented as arising out of the combinations of the Logical Alphabet, more or less of each series being struck out by various logical conditions". Does it not seem a little more rational to suppose that if we have a series of four terms, we already have the number 3, and do not, as he says, get it "from the condition that A must be either B or C, so that the combinations are ABC, AB*c*, A*b*C".

Boole discovered that an algebra, in order to be fitted for application to Logic, must recognise the law AA = A, or (as he better expressed it) $x^2 = x$, or $x(1-x) = 0$; which combines two laws since it expresses what in Prof. Jevons's notation would be written A*a* = 0, and it was called by Boole the Law of Duality as showing that we always naturally perform dichotomy, dividing the universe into x and *not* x, so that $x(1-x) = 0$,—a thing cannot be both x and *not* x. Boole thought that only two numbers obeyed this formal operative law $x^2 = x$, namely 1 and 0. But Prof. Jevons discovers, p. 161, that, "In reality all numbers obey the law. . . . In short, *twice two* is *two*, unless we take care that the second two has a different meaning from the first." If every second 2 must have a different meaning from the first 2, how is it that the one can be substituted for the other wherever it occurs? Is this not rather a forced way of trying to prove the statement at p. 156: "Number is but logical discrimination, and algebra a highly developed logic". He goes on (p. 162): "Mathematical symbols then obey all the laws of logical symbols". If this is true, we must credit Boole with one more great discovery in Pure Mathematics, for he brought to light a fundamental law of number, $x^2 = x$, which no one before him had suspected, and which I cannot believe even on Prof. Jevons's assurance.

At p. 113, he says generally of Boole: "It is a wonderful evidence of his mental power that by methods fundamentally false he should have succeeded in reaching true conclusions and widening the sphere of reason". For my part, I did not know that any mental power would enable methods fundamentally false to produce invariably true results.

GEORGE BRUCE HALSTED,
Fellow of the John Hopkins University, Baltimore.

Mill's Theory of the Syllogism.—In Mill's famous chapter on the Functions and Logical Value of the Syllogism, it seems to me that he has included under the Syllogism two things that ought to be kept separate and distributed under different heads in the logical system. Perhaps I may even go the length of saying that what he gives as Syllogism, is not properly Syllogism at all; but I will at the outset confine myself to the assertion that what he gives is the least prominent fact in the theory of the Syllogism.

The first of the two objects of the Syllogism, the one that Mill sets forth almost exclusively, is to exhibit the full form of the Deductive process in its simplest type: 'Men are mortal, kings are men, kings are mortal'. It is an interesting and useful part of Logic to explain in what consists a scientific deduction, or inference from generals to particulars, as in the onward march of a deductive science. You must first obtain somehow a general rule or law; you must next prove an identity between a given instance and the subject of the rule or law, and the identity being made good, you may apply the predicate of the general law to the subject of the new instance. You identify kings with the objects named men, and you pass over to kings the predicate of the law, mortality.

Now, I apprehend that this explanation, although valuable as a part of Logical Method, and undoubtedly connected with the Syllogism, is the thing that is least present to the mind of the Syllogistic logician. It belongs almost entirely to the matter of reasoning, and scarcely at all to the form. It fastens the attention upon the two circumstances, in the matter, necessary to a good deduction—the truth of the principle and the relevance of the case to be brought under it; the one circumstance to be made good by a material induction, the second circumstance dependent on a material identification—the examination of actual kings with a view to identify them with men at large. In the engrossment of the mind with these two grave determinations, the form is left almost entirely out of sight. The case has been chosen so as to make the least possible demand upon the consideration of form. The question as to a proper formal relation between the premisses and the conclusion is rendered dormant, because the relation is so simple and obvious as not to constitute a question.

Now it is to this simple type of reasoning, in which all that is characteristic of Syllogism escapes attention, that Mill confines his view; on it he makes out Syllogism a *petitio principii*, as commonly viewed, and indicates the solution by recalling to mind the proper meaning of a general proposition.

The second meaning of Syllogism, then, is the *formal* relation between the premisses and the conclusion, whatever the matter be. If all syllogisms, all cases of argument or inference, were of the type of Barbara, I doubt whether Syllogism would ever have been invented. Not that in Barbara there is not an element of form; but that being so easy, we need not even be conscious of it. But the inventor of the Syllogism was awakened to the fact that in many kinds of reasoning, not unfrequent in their occurrence, the formal relation of premisses to conclusion was puzzling and uncertain, not to say misleading; and he set his great ingenuity to work to exhaust the varieties of legitimate formal relations, to reduce them under heads, and to ascertain what characteristics of propositions they grew out of. I apprehend that the machinery of Figures and Moods, resting as it does on the Conversion of Propositions, of various quantity and quality, is the most strict and proper expression of the Syllogism. This part of reasoning is found to make a study of itself; and its expounders are not to be held as denying the necessity of looking to the matter on the proper occasion.

On this view, the theory of the Syllogism is not the whole theory of the proof of a conclusion from its premisses : it is the theory of one part of the proof, which in some instances is so evident as not to make a question at all, but in other instances is so embroiled with perplexity in the verbal statement, as to demand the help of a rule or formula such as is furnished by the detailed figures and moods. If logicians have been too exclusively occupied with this formal condition of sound inference, that is their infirmity. Any formalist that chooses to state his position guardedly, could, in answer to the charge of *petitio principii,* retort upon Mill the equally grave accusation of *ignoratio elenchi.*

The solution of the difficulty attending the material inference, for which Mill deserves and has received the highest praise, grows out of the sound view of general names and propositions, which any thorough-going nominalist would be likely to bring to the light. I apprehend that the place of this explanation in a logical system is antecedent to Syllogism; it would properly fall under the Name, or at least under the Notion or Concept, and would be carried from thence to the Proposition. In laying down the characteristic of the *general* proposition, the warning should be given that the generality is to a certain extent a fiction; the affirmer of the proposition, 'All matter gravitates,' is speaking of some things that he knows and of a great many things that he does not know : his proposition is a mixture of the actual and potential; it affirms what is to be when the case arises; when any new piece of matter is found, the proposition is to apply to that. A patent of peerage is given for those that are not yet born; it is therefore, in one sense, an empty behest : there is as yet nothing corresponding to the term.

When this is seen to be the character of the general proposition, the inference from it is no longer a repetition of the major. The major is whoever shall be descended from a given person; the minor is—a child has been born to that person; the conclusion greets this child as the future peer. The process of investing the newly discovered individual with the attributes belonging to the previously known individuals of the same kind is something to be gone through; it is not mere emptiness or nonentity.

A large part of Mill's chapter is occupied with illustrating Material Deduction. He described very justly what this consists in, namely, examining whether the new case possesses the marks that identify it with the rule, or with the individuals that give the meaning to the rule. Now, this I hold to be extraneous to the consideration of the Syllogism, on any admissible view of it. I maintain this on two grounds : first, it is not of the same kindred as Syllogism; second, it is of the kindred of Induction.

If Syllogism be, to use De Morgan's expression, 'the form, the whole form, and nothing but the form,' Material Deduction can have no place in it. But the obverse position is more instructive. Is Material Deduction of the kindred of Induction? To answer this, we have only to reflect that an induction is the material comparison of individual facts, carried on till we are satisfied that we have established a coincidence (or non-coincidence) between property A and property B such as we can rely on in all future cases; so that whenever A turns up, we assume at once that B is (or is not) there also. Now Deduction is the ingathering of the new cases; and the logical part of the operation lies in the material inspection of each suggested case to see whether it is or is not an A—the comparison of it with the previously recognised A's. Just as Induction is a comparison of like instances, so Deduction is a comparison of like instances. The induction has arisen by finding the resemblance of A, C, D, E: the deduction finds the resemblance between X and these others; the mental exercise is therefore one and the same. It relies upon the same species of ability, it incurs common liability to mistake, and is fenced by the same safeguards. The only respect where it fails is in not looking to the *conjunction* of A and B; this, however, is merely to confine the process, without altering the character of it.

Although Deduction is thus of a kindred with Induction, it farther resembles Classification, which is also a process of the matter—a comparison of facts in their concrete character. It contains the process that Induction and Classification agree in—the making sure of a resemblance between particulars. If Induction is made to precede Classification, the process is first brought on the stage under Induction; if the order were changed, it would in substance be brought up under Classification. Still, it would re-appear under Induction; and the place for it is not difficult to assign. If we refer to Mill's chapter on the Deductive Method, we see that he brings in this method after he has finished his Experimental Methods. We see also that his idea of the Deductive Method is "to find the law of an effect from the laws of the different tendencies of which it is the joint result". This supposes that the laws of the tendencies have been previously ascertained by Induction, and are now to be extended by Deduction. The first stage of the deduction is to follow out each separate law by itself: to hunt out new applications by new identities. Great discoveries and important verifications may be effected by going in the track of a single induction, by gathering in the remote and unthought-of instances; as when Newton pushed gravitation to such recondite consequences as the precession of the equinoxes. There is thus a department of deductive inquiry and proof anterior to Mill's calculation of combined tendencies. This department has no place in Syllogism, it has no relation to any Syllogistic operation; it is the same comparison of instances as is employed in building up an induction. Whatever is proper to be said about it, whatever directions may be given for it, should be at the point where Mill's Deductive Method is launched, and just before his problem of computing combined tendencies. If nothing needs to be said about it, so much the better; but something is actually said by Mill—in the wrong place.

It was considered by many—most emphatically so by Grote—that Mill had introduced for the first time a unity into Logic, had bridged the chasm that separated the Inductive from the Syllogistic Logic. In my opinion, this cannot be done, and should not be attempted. Real or Material Deduction should certainly be made continuous with Induction and with Classification, but Syllogism stands apart from them all; it is as far off from Deduction, in Mill's rendering, as it is from Induction. The consideration of the formal relation of the premisses to the conclusion, which the inversions of language compel us to regard as a serious study, has nothing in common with the Logic of Matter, in any one of its three divisions—Classification, Induction, Deduction. It walks by the side of these, and is no farther connected with them than as ministering to a common purpose. I could not assign any reason for the particular place or order of the Syllogism in Mill's *Logic* or in any of the systems that include Induction. It might be just as well at the end as at the beginning. Its entire absence would not be felt in any of the problems of Induction or of Classification. It gives a discipline altogether apart.

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It may, therefore, in my opinion, be justly objected to Mill's chapter, first, that the ideas, which are individually sound and valuable, are taken out of their proper places, and put together in an incongruous compound; and second, that the title is a misnomer: there is nothing actually said as to the Functions and the Value of the Syllogism.

A. BAIN.

J. S. Mill's Philosophy tested by Prof. Jevons.—It has been understood for some time that Prof. Jevons was engaged in a critical scrutiny of Mill's philosophical writings, and recently, in the new edition of his *Principles of Science*, he announced his intention of publishing a book on the subject. The incidental criticisms on Mill that lie scattered through his previous works had hardly justified the anticipation of very important results from the more formal scrutiny when it should appear; nor was the specimen he gave of it a few weeks ago, on occasion of a controversy in the *Spectator* about Mill's doctrine of Religion, encouraging, for he then laid himself open to a very smart rebuff from his adversary. Now, in the *Contemporary Review* of December, he returns to the charge, and, after rehearsing shortly (with some difference) the *Spectator* dispute and sounding a preliminary flourish, he brings out one of his greater guns and fires it off against Mill. At the same time we are promised a whole series of papers, to follow on the present one which deals with Mill's view of the foundations of geometry. So the regular battle, or rather bombardment, must be understood as begun, and begun it certainly is with no ordinary fury. The plan of attack has its disadvantages, but at all events it leaves the assailant time for reflection after delivering his fire, and it may not be amiss that a bystander should venture to interpose with a few words at the first pause.

For about twenty years past, so we are told, Prof. Jevons has been a more or less constant student of Mill's works, and during the last fourteen years he has been compelled, by the traditional requirements of the University of London, to make them at least partially his textbooks in lecturing. Some ten years of study passed before he "began to detect their fundamental unsoundness," and during the last ten years the conviction has gradually grown upon his mind that "Mill's authority is doing immense injury to the cause of philosophy and good intellectual training in England". Able writers have fired this shot or that into "the sand of his foundations," but "the assault must be made directly against the citadel of his logical reputation". "For my part," exclaims Prof. Jevons, "I will no longer consent to live silently under the incubus of bad logic and bad philosophy which Mill's works have laid upon us". "The disconnected and worthless character of his philosophy" shall at length be exposed. As for his logic—his logic indeed! "There is nothing in logic which he has not touched, and he has touched nothing without confounding it."

It is all very curious: curious that it should have taken ten years to discover Mill's defects; curious that in ten years more it should not have been discovered that all of them that are real have been well-known to philosophical inquirers for a long time past, and that the world has by no means stood still the while. Is it not the fact that those who think most highly of Mill are some of those who differ most gravely from him? They think of him as one who gave an unsurpassed expression—an expression that will *now* probably never be surpassed—to the philosophy of individual experience, but they have left this behind. They are perfectly familiar with all the inconsistencies that Prof. Jevons would now laboriously bring to light; and yet they can honour the man who, from the point of view that satisfied all the masters of English thought before him, first set himself in a serious spirit, since the sciences have grown, to devise a comprehensive theory of scientific knowledge. His friend, Prof. Bain, who stands perhaps nearest to him in point of logical theory, is far from agreeing with him altogether, (as this very number of MIND bears fresh witness), and never was beholden to him in psychology: rather it was Mill that here professed himself the learner to the last. Mr. Spencer and Mr. Lewes—to say nothing of younger men—have gone ways of their own that are very different from Mill's, and which he was little disposed to follow. Many will acknowledge that they have learned from him, but is it possible to name one thinker or teacher of any standing who is prepared to subscribe himself Mill's disciple? For whose benefit, then, one wonders, is this series of papers to be written?

No doubt, his books are much in the hands of students; but there is a good reason for that. Since Mill's *System of Logic* appeared, has there been any other work half so well fitted to stimulate thought on the subject? Prof. Jevons appears, by his way of printing the word, to have some special contempt for Mill's assumption of having produced a "system". If this is what he means, surely never was contempt so little in place. Mill's book is a model of orderly methodical exposition, and, though never specially intended for academic use, fairly conquered the attention of teachers and students It must have been because of its inherent merits, for no writer could have started from a more unfavourable position than Mill or cared less, in edition after edition of his work, to make it accessible to the multitude. Accordingly, it is open to any one at any time to oust the book from its academic standing. One has only to write a " system " as carefully articulated as Mill's, as clearly grounded in its philosophical basis, and, if it reflects the present enlarged conceptions of Experience as faithfully as Mill's philosophy embodied those of a past time, no fear but the writer will quickly deliver the Universities from their "incubus"—particularly if he has an intimate knowledge (Mill had none) of students' needs. For the present, if it be the fact—as Prof. Jevons has somehow convinced himself though he must be singular in his belief—that the voice of Mill alone is heard in the schools, let us be thankful that it is no worse than it is. We may remember, too, that it is the way of academic instruction to lag somewhat behind the pace of advancing inquiry.

At this time of day there is no need to spend many words on the objections brought by Prof. Jevons against Mill's view of geometrical science. The case is very cleverly put and will duly impress the imagination of all those who can believe with himself that the like was never heard before ; but everything in his argument that has any force has been urged by others over and over again, and what is new is not very happily urged. His great point is to show that Mill, after asserting that perfectly straight lines do not really exist, ends by implying and even asserting that they do exist, because the imaginary lines with which the geometer is said to work (or "experiment") are declared to " exactly resemble real ones ". But here he misconceives Mill's plain meaning to begin with, and before he reaches his conclusion he has to interpolate a premiss for which Mill is not in the least responsible. In denying (with whatever reason) that straight lines really exist, Mill never says that we have no perception of lines as apparently straight. So, when he comes to deal with the imaginary lines by which he supposes the geometer able to increase his experience indefinitely, he may very well say that these exactly resemble the lines that are perceptibly (without being really) straight. The premiss interpolated by Prof. Jevons, in order to convict Mill of self-contradiction, is the assertion that " if these imaginary lines are not perfectly straight they will not enable us to prove the truths of geometry " ; but of course Mill would allow nothing of the sort. Did he not from the first declare, with Dugald Stewart, that there is a purely hypothetical element in the definition of geometrical figures, and that it is this, and not anything we can actually see or imagine, that enables us to prove the truths of geometry ? (See moreover a note added to his old statements in the latest edition of the *Logic*, p. 261.) However it is no affair of mine to defend Mill's positions. I, for one, cannot think of basing the knowledge of geometrical principles on individual experience, least of all on that kind of passive experience, received by way of the senses, which Mill, without making proper use of the psychology he accepted, generally was content to assume. That all his ingenuity should fail to prove his case, and that, in his anxiety to solve so great a difficulty, his very ingenuity should land him in such really discrepant assertions as Lange, for example (*Gesch. des Mate-*

rialismus, Vol. II., p. 18), points out, is only natural. I will add but one other remark on Prof. Jevons's polemic, namely, that he seems to me particularly unfortunate in singling out for especial rebuke that which Mill calls "geometrical experimentation" with imaginary lines. Mill there had come imperfectly (as I have elsewhere tried to show, art. "Axiom," *Encycl. Brit.*, ed. 9th) upon an equivalent for that work of the "productive imagination" which plays so important a part in Kant's classical explanation of geometrical synthesis. He had come upon it imperfectly because he did not ground this process of free "experimentation," as he might have done, in the psychological fact that we apprehend extension through muscular activity that we consciously put forth, and not through any sensations passively received. But his recognising the process at all was a proof of no ordinary insight; and if Professor Jevons would only think of it as something not quite absurd, he might arrive at some rational explanation of the difference that he always notes in his own works, but never in the least accounts for, between geometrical and physical induction.

And this last observation suggests the one other word I will take the liberty of addressing to my friend Prof. Jevons on the present NB occasion. It will doubtless occur to many readers that Mill's vehement critic comes upon him after all only in the guise of Nemesis for his own treatment of Hamilton. Neither am I one of those who rate the *Examination of Hamilton* most highly. But if to some extent Mill did then no better than Prof. Jevons is now doing, in one respect he did in that book very well. In the midst of all his criticisms on Hamilton, he offered some very notable independent contributions to NB philosophical theory; and but for the *Examination* we should not know Mill's mind on many of the most pressing questions of philosophy. Whole chapters and many parts of chapters are constructive. Now may one hope that Prof. Jevons will not fall below this example? NB He is very indignant over Mill's "false empirical philosophy," but guards himself against being supposed to deny the experiential foundation of all knowledge; and the *caveat* is very much in point from one who can write about the senses and what we get from them in the *naïf* way of the author of *The Principles of Science*. Will he then, for once in a way, tell us quite plainly what he considers are all the elements of a *true* empirical philosophy? If he does, he will supply a much-needed foundation for his logical theories, and, though the work would be done better without the accompaniment of a war-dance over the prostrate form of Mill, he has a right, if he pleases, to that kind of amusement. If he does not, his exhibition may win him a great deal of applause from the prejudiced and the unthinking, supposing always that he manages to remain to the end as piquant as in the first act; but at the end, Mill will be found to hold just the place that he holds now in the estimation of all serious thinkers who know what is and what is not. Will Prof. Jevons retain *his* place?

EDITOR.

IX.—NEW BOOKS.

Lessing: his Life and Writings. By JAMES SIME. 2 vols. London: Trübner & Co., 1877. Pp. 327, 358.

LESSING is a name which, in addition to its charm for lovers of literature in general, has special attractions for the student of philosophy, and English readers are to be congratulated on the almost simultaneous appearance, though at this late hour, of two accounts of the man and his work—Miss Zimmern's, which for some time has been announced, and Mr. Sime's. Mr. Sime's volumes embody the results of careful scholarship and independent reflection. He renders, on the whole, ample justice to the philosophical side of his subject. Chapter xxix., which treats of Lessing's philosophy, with which chapter xxvii., containing an account of *The Education of the Human Race*, should be taken, defines Lessing's position in relation to the leading philosophic questions of his day. Lessing was one of the first to formulate that idea of progress which was one of the most valuable products of eighteenth century thought, although Mr. Sime appears to go too far when he says that "in *The Education of the Human Race*, the idea of progress was first formally stated," and that it became the possession of cultivated Europe, through Lessing and Herder. It is probable that Priestley—who wrote before Lessing and who stimulated Condorcet—did as much at least as Lessing to give shape and stability to the new doctrine. In the more abstract department of philosophy, Lessing's services consist mainly in the exposition and popularisation of Spinoza, a thinker whose claims up to that time had been grossly neglected. Lessing had found his way to Spinoza out of the intricacies of the dominant Leibnitzo-Wolffian philosophy, and the little he has left us in writing and recorded conversation illustrates, as Mr Sime very clearly points out, the condition of mind of one who was a careful and thoughtful learner from both Spinoza and Leibnitz, a learner who drew now from the one, now from the other, without seeking to reduce the ideas thus acquired to a harmonious and systematic shape. Of Lessing's work in Æsthetics, which is, perhaps, after all his most valuable bequest to students of philosophy, Mr Sime gives us a full and appreciative account. The method followed in the *Laokoon*, and in the *Hamburg Dramaturgy*, was nothing less than a fruitful discovery in the science of criticism, as the permanent results attained amply testify. No doubt Lessing's field of observation was limited, and in the case of dramatic theory he was (as the present writer has elsewhere maintained) unduly influenced by classic authority. Yet, though some of his conclusions may at first appear narrow and arbitrary to us, this generally arises from the fact that he is not concerned to limit and qualify the principles he reaches. All art is a compromise between many principles or ends, and this Lessing knew well enough, though he had no special occasion to enforce the truth. This fact, however, does not preclude the possibility of reaching conditions which on the whole, and when there is no special reason to override them, mark off certain forms of art from others. We could wish that Mr. Sime had criticised both the *Laokoon* and the *Dramaturgy* with a fuller recognition of the essential character of art principles. Had he done so, he would not so lightly have rejected some of Lessing's conclusions respecting the visual arts as wholly arbitrary, merely because he was able to find a number of exceptions to Lessing's rule even among works admitted to be excellent. Thus, for instance, it may be, on the whole, undesirable to present the fugitive and evanescent in permanent pictorial representation, even though Mr Poynter, for the sake of a rich and striking effect, chooses to represent Atalanta in the act of stooping to pick up the golden apple as she runs. On the whole, however, Mr. Sime's remarks on Lessing's theory of art are just and discriminating. [J. S.]

New and Old Methods of Ethics, or "*Physical Ethics*" and "*Methods of Ethics*". By F. Y. Edgeworth, M.A. Oxford and London: Parker & Co., 1877. Pp. 92.

This is an attempt to mediate between the conceptions of a Physical and an Introspective Ethics as represented by Mr. A. Barratt and Mr. H. Sidgwick, and also to develop these conceptions more fully than has yet been done. Section I. takes up the principal points at issue between these two writers. Intuitivism as defined and justified by Mr. Sidgwick is defended as against the Egoistic Hedonism of Mr. Barratt. At the same time the possibility of placing an adequate ethical doctrine on a physical basis is fully maintained. The conditions necessary to this perfection of ethical science are said to be: (1) That all non-hedonistic action (if such there be) is of the nature of personal or ancestral habit; (2) that the physical conditions of the genus non-hedonistic action and the species sympathy are discoverable; (3) that the physical conditions of this perception of rightness (sentiment of duty, &c.) are discoverable. The writer seeks to obviate the objection of J. S. Mill (repeated by Mr. Sidgwick) that the imperatives of Ethical Science cannot be deduced from propositions relating to matters of fact. Under Section II. various points raised in the *Methods of Ethics* are more directly dealt with. By far the largest part of this section is taken up with an elaborate attempt to "extricate a clear, and, as it may be termed, a mathematical conception of exact Utilitarianism". Setting out from Bentham's formula "the greatest happiness of the greatest number" (which though unsatisfactory is said to contain implicitly the idea of an exact Utilitarianism) and fully equipped with the latest conceptions of psychophysics as defined by Fechner, Wundt, &c., and with those formulæ of the calculus of variations which are applicable to the problem, the writer reaches a number of conclusions respecting the best possible (that is the most felicific) distribution of the external means of happiness. These results "neither unexpected nor yet distinctly foreseen by common sense" may be gathered up as follows: (1) In the case of races or societies so nearly related in the order of evolution as the Aryan, equality of distribution is the law; only when there is a great interval (as between highly civilised races and savages) is the superior class to be privileged. (2) Population ought to be limited. (3) As to the quality of the sentients or recipients, this should be as high as possible, as measured by the scale of Evolution (which tends to increase indefinitely the capacity for happiness); but if number and quality should ultimately come into competition, the indefinite improvement of quality is no longer to be wished. That is to say, if in a stationary state of industry an increase of culture, owing to its material cost, is only possible by means of a diminution of population, it should not be aimed at. "Not the most cultivated coterie, not the most numerous proletariate, but a happy middle class shall inherit the earth." The pamphlet contains a large number of suggestive criticisms on other recent ethical writers besides the two put prominently forward.

The Methods of Ethics. By Henry Sidgwick, M.A., Prælector in Moral and Political Philosophy in Trinity College, Cambridge. Second edition. London: Macmillan, 1877. Pp. 469.

The alterations and additions in the second edition of Mr. Sidgwick's *Methods of Ethics* are so extensive that the Supplement (issued in a separate form, for the convenience of possessors of the first edition) runs to over 120 pages: there is, however, no important change of view on any essential point, and the additions being mostly substitutions, the volume is not increased in size. Nearly half of the new matter belongs to Book I. The introductory chapter has been nearly rewritten, and § 1 of ch. ii. entirely; the latter now containing a much more luminous discussion of the relation of Ethics to Politics both from the Utilitarian and Intuitional points of view. Ch. iii. again, on "Reason and Feeling," is almost all new, and gives a more thorough and distinct account of the author's theory of Reason as a moral faculty, which is the key of his position. Perhaps the most serious change of opinion which the new edition shows is contained in ch. iv. on "Pleasure and Desire" (§ 1). Mr. Sidgwick formerly maintained that the psychological doctrine that volitions are always determined by the greatest pleasure (or relief from pain) in prospect is incompatible with any Method of Ethics except Egoistic Hedonism. But this he has seen fit to retract, on reflecting that to conscientious persons the pleasurableness of conduct is more or less dependent on its rightness. Ch. v., on "Free Will," in spite of some difference in the exposition, is not materially altered. Towards the end of ch. vi. § 2, a short paragraph on the evolutional interpretation of "Conformity to Nature" deprecates any hasty assumption that we may identify "what ought to be" with "what certainly will be". Amidst the new matter in ch. vii. occurs the significant remark that "the notion of self-realisation is to be avoided in a treatise on Ethical method, on account of its in-definiteness". The chief additions in Book II., chs. ii. and iii., are foot-notes in answer to objections urged by Mr. Green. A clearer account of the notions of Motive and Intention has been inserted in Book III., ch. i. In ch. ii., § 2, an alteration appears in the definition of Virtue. In ch. xiii., there are extensive modifications: the intuitive principle, that it makes no difference to the general sum of good to what subject any part of it belongs, is perhaps less distinctly expressed (§ 3); and the misunderstood passage (§ 5) concerning the "suppression of Egoism" has itself been suppressed. Readers of MIND will recognise in ch. xiv. some ideas which were published in No. V., in an article by the author on "Hedonism and Ultimate Good". Interest in the alterations in Book IV. will probably centre in the last chapter: it has been re-cast, but the doctrine of the "Dualism of Practical Reason" remains.

The Principles of Science: a Treatise on Logic and Scientific Method. By W. STANLEY JEVONS, LL.D., &c. Second edition, revised. London and New York: Macmillan & Co., 1877. Pp. 786.

THIS second and cheaper edition has been revised throughout and appears with a great number of verbal and other changes, but none of them radical. In a new preface (pp. xxvi.), the author gives a number of interesting historical references, and replies to some of the critics of his first edition. It appears that the well-known (third) Lord Stanhope long ago busied himself, among his other inventions, with a mechanical device for the representation of logical inferences, and, his Demonstrator (as he called it) having lately been placed with his papers in the hands of the Rev. R. Harley, F.R.S., some account of it may shortly be expected. The other historical matter of chief importance into which Prof. Jevons enters is Leibnitz's anticipation of the Principle of Substitution, to which his attention has been called by Prof. Adamson. He replies to his critics (among others his critic in MIND, No. II.), in a very candid spirit, though he shoots rather wide of some of the objections urged against him. One or two of the corrections suggested in this journal he has accepted. It is a pity, when he was about it, that he did not accept some others. We are still, for example, told, at p. 63, that a valid conclusion may be obtained from two negative premisses, when it is plain that either there are four terms, or if three terms then only one negative premiss. Also, at p. 58, where he gets the conclusion $A = B$ from the two premisses $A = AB$, $B = BA$, he still goes on to say, with a singular inversion of the plain meaning of words, followed at once by an absolute refutation of himself, that "the conclusion is more simple and general than either of the premisses, and contains as much information as both of them put together". How can a compound be "more simple" than its elements? How can a special relation that holds only under two relations taken together be "more general" than either of them? Or how can that which "is more simple and general than either of the premisses" contain "as much information as both of them put together."? This, of course, is but a sample of what must happen, if one will start, in Logic, from A = B as a "Simple Identity". A simple *identity* it may be, but Prof. Jevons himself here proves it to be anything but a simple *proposition.* No doubt, however, a change at this point would have been very radical.

Life and Habit. By SAMUEL BUTLER. London: Trübner, 1878. Pp. 307.

AN attempt by the author of *Erewhon* to consider, in a popular way, whether the unconsciousness, or quasi-unconsciousness, with which we perform certain acquired actions, throws light on embryology and inherited instincts, also upon the question of the origin of species and the continuation of life by successive generations. The phenomena of heredity he finds to be so like those of memory, and to be so utterly inexplicable on any other supposition, that it is "easier to suppose them due to memory in spite of the fact that we cannot remember having recollected, than to believe that because we cannot so remember therefore the phenomena cannot be due to memory". Our inherited experience was gained by us when we were in the persons of our forefathers. The accumulation of variations which in time amounted to specific and generic differences of living things, was due to intelligence and memory in the creature varying, rather than to natural selection. "Life is that property of matter whereby it can remember. Matter which can remember is living; matter which cannot remember is dead."

Diseases of the Nervous System: their Prevalence and Pathology. By JULIUS ALTHAUS, M.D., &c. London: Smith, Elder & Co., 1877. Pp. 366.

THE author has "endeavoured to elucidate the part played by diseases of the Nervous System in national pathology, and to show the laws to which their occurrence and fatality are subject". He has also "fully entered into the special pathology of the several diseases of the nervous centres". "The pathology of peripheral nerve-diseases, and the diagnosis, prognosis, and treatment of the entire class of these maladies will be considered in a subsequent volume."

What is Play? Its bearing upon Education and Training. A Physiological Inquiry by JOHN STRACHAN, M.D. Edinburgh: Douglas, 1877. Pp. 108.

A VERY interesting and, in the main, a wise little book. Taking Play to mean all "active exercise in the young, prompted by natural inclination and producing pleasure," the author first shows its importance for bodily "development," as opposed to mere "growth" (such as goes on without development in a bedridden child). He then passes to Play as an exercise of the Mind, and comes to the conclusion "that exceptional mental development is always preceded, and is indeed produced, by an exceptional amount of exercise in play of the special faculties concerned". Play is, in fact, found to be in all cases a preparation for Work, differing from work only in its motive and object; and the different play-instincts both of the sexes and of individuals should be regarded by the educator as indications of the right courses to follow in express training.

Theism: being the Baird Lecture for 1876. By ROBERT FLINT, D.D., LL.D., Professor of Divinity in the University of Edinburgh, author of *The Philosophy of History in Europe.* Edinburgh & London: Blackwood, 1877. Pp. 432.

"The lectures in this volume have been delivered in Glasgow, St. Andrews and Edinburgh, in connection with the lectureship founded by the late Mr. James Baird of Auchmedden and Cambusdoon. They will be followed by a volume on Antitheistic Theories, containing the Baird Lectures for 1877."

"Contents: (1) Issues involved in the question to be discussed—Whence and how we get the idea of God. (2) General idea of Religion—Comparison of Polytheism and Pantheism with Theism—The three great Theistic Religions—No religious progress beyond Theism. (3) The nature, condition and limits of theistic proof. (4) Nature is but the name for an effect whose cause is God. (5) The argument from Order. (6) Objections to the argument from Order examined. (7) Moral argument—Testimony of Conscience and History. (8) Considerations of objections to the Divine Wisdom, Benevolence and Justice. (9) *A priori* theistic proof. (10) Mere Theism insufficient."

In an appendix (pp. 323-425) the author has a number of notes, chiefly controversial, on different philosophical aspects of the question.

The Causational and Free Will Theories of Volition: being a review of Dr. Carpenter's *Mental Physiology.* By MALCOLM GUTHRIE. London: Williams & Norgate, 1877. Pp. 106.

The author supplies the following statement:—

"Part I. is an exposition of the Causational Theory, followed by a reply to the objections brought against it by Dr. Carpenter, namely: (1) That it involves Materialism. (2) That it makes man an automaton: the employment of which term in modern discussions is condemned, while in practical use it is shown to be identical with either 'causation' or 'involuntary'. (3) That Choice is incompatible with Causation; the reply being that choice is the exercise of Practical Reason, which is defined. (4) That Effort is incompatible with Causation; the reply being the suggestion of a motive having for its object the effectuation of Volitions. (5) That on the Causational Theory there can be no blameability or responsibility.

"Part II. is a statement of the Free Will Theory, with an examination of the terms employed. Then follows a criticism of the Self-Determining Power to ascertain where the breach of continuity of sequence occurs, showing that the said power must eventually be regarded as a faculty having its due place amongst others. The concluding section shows by means of extracts from Dr. Carpenter's work, that, whatever it is, it is subject to laws of Heredity, Education, Adaptation, &c., the same as every other human activity.

"An appendix contains a criticism of Mr. Bradley's *Ethical Studies*, Essay I.".

Die geschichtliche Entwickelung des Farbensinnes. Von Dr. Hugo Magnus, Privatdocent an der Univ. Breslau. Leipzig: Veit, 1877. Pp. 56.

Die Entwickelung des Farbensinnes. Von Dr. H. Magnus, &c. Jena: Dufft, 1877. Pp. 22.

Working on the basis of historical research laid down by Geiger *(Zur Entwickelungsgeschichte der Menschheit)*, Gladstone *(Homeric Studies)* and others, Dr. Magnus, in these two tracts, reaches the following conclusions:—(1) In the earliest stage of the development of the colour-sense, red was the only colour recognised as such, while even this was not clearly distinguished from brightness or mere light; at this stage the single function of the retina was sensibility to different quantities of light. (2) In the succeeding stage, the sense of colour was more sharply differentiated from that of light, red and yellow now being discriminated from mere brightness. (3) In the next stage, the light and dark shades of green became distinguished as independent colours, the first from pale yellow and the second from darkness in general. (4) Finally, in our own stage, blue and violet are recognised as colours, though these are not yet perfectly separated except by the more cultivated eyes. That is to say, the course of development of the sense of colour has corresponded with the prismatic order, beginning with the colours (reds) most rich in light and gradually arriving at those (violets) of feeblest light-intensity. These facts are thus conceived by the author. The sensibility to colour is a higher function of the retina, which appears only when its irritability or excitability has been increased and made more delicate through the incessant action of the light-stimulus. "As an immediate consequence of this intensified and refined activity, the retina acquired the capability of distinguishing the colour of the impinging rays as well as their light-intensity." Dr. Magnus illustrates the relation here assumed between the sense of colour and the condition of excitability produced through light-intensity, by a reference to the familiar fact that even to our developed organ coloured light loses its colour when (as reflected by objects in evening dusk) it falls below a certain intensity or degree of luminosity. The author conceives that the peripheral regions of the developed retina which are very inferior in the discriminative sense of colour represent a past stage of development of the eye as a whole. Wisely perhaps, he does not seek to bring his results into connection with either of the two principal theories respecting the physiological conditions of sensations of colour which are at present in vogue in Germany. It might be found that they are capable of being more fully interpreted either by the hypothesis of Young and Helmholtz—that different colours involve different nerve-elements, or by the theory of Wundt—that all differences of colour-impression depend on the form of excitation of the same elements. Dr. Magnus cannot be said to supply an adequate physiological interpretation of his facts, though he has certainly rendered good service in preparing the way for such an interpretation. [J. S.]

Gedanken über die Socialwissenschaft der Zukunft. Von Paul v. Lilienfeld. 3 Bde. Mitau: Behre, 1873-7. Pp. 399, 455, 484.

These volumes start with the conception of Society as a real organism, and attempt to work out this point of view upon the methods proper to the Natural Sciences. The treatise commences with a demonstration that Society consists of individuals in the same manner as the physical organism is made up of cells, and that the one is real in the same sense as the other. With this idea the author seeks to exhibit a thorough-going identity between the laws of Nature as they exist in the case of its highest development, Society, and in its lower stages, including the individual human being. The first volume is entitled "Human Society as Real Organism;" the second, "The Laws of Society;" the third, "Social Psychophysics;" and a fourth is promised upon "Social Physiology". The first three parts are worked out with great minuteness, the connecting thread being the conception of a real analogy between the individual and the social group as the essential foundation of the Social Science of the future.

Das Problem einer Naturgeschichte des Weibes. Historisch und kritisch dargestellt von Friedrich von Baerenbach. Jena: Dufft, 1877. Pp. 126.

Not intended as a *solution* of the problem of a Natural History of Woman—for which the author invokes the exertions of an inquirer like Mr. Darwin—but as a statement of what it must involve as the preliminary step towards determining her true social position. The author got his impulse from Schopenhauer and Michelet, who, in spite of their differences, seemed to him to work in the same scientific direction. Among English writers, he is most beholden to Prof. Huxley.

Vorträge und Abhandlungen. Von Eduard Zeller. 2te Sammlung. Leipzig: Fues's Verlag (R. Reisland), 1877. Pp. 550.

In this second series of collected essays (sixteen in number) by Prof. Zeller, rather more than half are on philosophical subjects. The last four are academic addresses that excited much attention at the time of their delivery, and it is well they are now reproduced in a form that will henceforth make them accessible for reference: "On the problem of Philosophy and its relation to the other Sciences" (1868); "On the present position and task of German Philosophy" (1872); "On the meaning and problem of Theory of Knowledge" (1862) with "Additions" (1877); "On the Teleological and the Mechanical explanations of Nature as applied to the Universe" (1876). The series opens with a long discussion "On the origin and essence of Religion" (1877), followed by a paper on "Religion and Philosophy among the Romans" (1865). The subject of another essay is "Lessing as a Theologian" (1870).

Kant's Begründung der Ethik. Von Dr. HERMANN COHEN, ord. Prof. der Phil. an der Universität zu Marburg. Berlin: Dümmler, 1877. Pp. 328.

THE acknowledged leader of the Neo-Kantian movement in Germany here follows up his classical interpretation of Kant's Theory of Experience with an exposition of the fundamental principles of the Kantian Ethics. Prof. Wundt's general sketch of the movement in the last number of MIND may, it is hoped, be supplemented before long in these pages by a fuller appreciation of the later Kantian literature, and then will be the time to do justice to Prof. Cohen's varied activity. The preface of his new work contains a short but very striking defence of his philosophical position. Rejecting the imputation of aiming at a mere "Kant-philology," he does not hesitate to declare that Kant's "Transcendental Method" must henceforth rank as of no less account for Science in general than the fundamental logical principles themselves; and that the advancing philosopher of the present day has a duty in relation to Kant like that of Newton's successors in physics to the author of the *Principia*. "Kantian philosophy is nothing else than philosophy as science," and the essence of science is to be steadily progressive from positions already won. As regards the special subject of his present work, the author holds it to be no accidental sign of the truth of the Critical Method that it bases the possibility of an Ethics in the Doctrine of Experience. To exhibit Kant's foundation of Ethics is to show Ethics based in the Theory of Knowledge.

Die Vorsokratische Philosophie der Griechen in ihrer organischen Gliederung. Dargestellt von S. A. BYK. Zweiter Theil: "Die Monisten". Leipzig: Schäfer, 1877. Pp. 240.

THE author's first part appeared in 1876 and treated of "The Dualists," meaning those Pre-Socratic thinkers who assumed "a material foundation of all things, and by the side of this a principle of motion standing in no logical connection with it." By "Monists" he means those who assumed "either *one* absolute principle only, or, if a motor principle besides the absolute foundation, then one implicated in the very conception of it". As such "Monists," the author passes successively in review (1) The Eleatics, (2) Heraclitus, (3) Leucippus, and Democritus, (4) The Sophists.

X.—NEWS.

Mr. Douglas Alexander Spalding, well-known of late years for his observations on the first movements of young animals, died on October 31, at Dunkirk, on his way to the Mediterranean coast, where he was to spend the winter for the sake of his health. He had long suffered from pulmonary disease, before he was thus cut off at the age of 37.

His first observations were brought before the British Association in 1872, and afterwards worked up into an article on 'Instinct' in *Macmillan's Magazine* of Feb. 1873. Some farther observations, communicated to the British Association in 1875, were published in *Nature*, vol. viii., p. 289. All of them were very carefully made, and they may be held to have finally established what had often been asserted before but as often doubted or denied—the power of certain lower animals, especially birds, to perform extremely complex movements of an appropriate character on the first suggestion by way of the senses. It was when Mr. Spalding went on to theorise upon his observations that he became a less satisfactory guide. His facts did not, as he supposed, in the least touch the Berkeleyan theory of vision, regarded (as it should be) as an explanation of certain facts of conscious perception in human beings. And when he rode off upon his summary conclusion that "animals and men are conscious automata," he became a warning example of a certain tendency to premature and hasty speculation adverted to in some earlier pages of the present number. He not only fancied that nobody had ever dreamt of such an idea before, when in fact the whole Cartesian and even the Leibnitzian school had asserted (upon grounds of their own) a thoroughgoing parallelism with no cross-action of the physical and mental in man; and he not only went the length of doubting whether there were five people alive who were able to understand the conception. What was far more serious—he himself seemed to become incapable of taking an interest in anything else, and spent in an iteration of generalities (in critical notices of books for *Nature)* powers which, even in the short time allotted to him, might have solved several other questions of biological fact as satisfactorily as the first he attempted. Mr. Spalding who, though born in London, belonged to Aberdeenshire and spent his early years in Aberdeen, began life under great material disadvantages, and raised himself through his own exertions.

The remarkable paper by Dr. G. M. Beard on 'Trance,' reported upon in MIND, No. VIII., p. 568, has now been published in a separate form (Pp. 47, New York: Putnams' Sons) under the title *The Scientific Basis of Delusions.* It is "designed as an introduction to a work on the Philosophy of Delusions, which will aim to unfold in detail the phenomena of the Involuntary Life, including Trance, and to give practical suggestions for the reconstruction of the principles of evidence in their application to history and to logic, to science and to law".

A Chair of Logic and Moral Philosophy has at last been instituted in King's College, London; and the Rev. H. W. Watkins M.A., Chaplain and Censor of the College, has been chosen to fill it.

The Whyte Professorship of Moral Philosophy in the University of Oxford being vacant, through the clerical preferment of the late incumbent, Rev. J. R. T. Eaton (appointed in 1874), Mr. T. H. Green, of Balliol College, editor of Hume's philosophical works, has just been elected in his place.

The Chair of Moral Philosophy in Trinity College, Dublin, is vacant through the retirement of the Rev. Dr. McIvor, who has served the statutory period of five years for which it can (with re-elegibility) be held.

Mr. Malcolm Guthrie (31 Stanley Road, Bootle) sends the following "suggestion":—

"In Liverpool we have formed a small society of six or ten members called the 'Philosophy Reading Club'. Our plan is to take some work of philosophical importance and, after reading a chapter at home, to examine and discuss it at our weekly meetings. The advantages of this systematic and combined study over individual desultory studies are obvious. I have no doubt you would be willing to put your readers in different localities into communication with each other for that or similar purposes."

JOURNAL OF SPECULATIVE PHILOSOPHY.—Vol. XI., No. 3. Schelling—'The Method of University Study' (Lect. 4th, trans.). Von Hartmann—'On the True and False in Darwinism' (Sections trans.). Herbart—'Application of Mathematics in Psychology' (trans.). W. T. Harris—'Michael Angelo's Fates'. G. S. Morris—'The Life and Teachings of Spinoza'. D. W. Phipps—'Kant's Transcendental Æsthetic'. Kant—'Anthropology (trans. continued). Notes and Discussions, &c.

REVUE PHILOSOPHIQUE.—2me Année, No. X. H. Lotze—'Sur la Formation de la Notion d'Espace'. M. Straszewski—'La Psychologie est-elle une Science'? D. Nolen—'L'Idéalisme de Lange'. Notes et Documents—'Cause et Volonté,' par Alexander Main. 'Malebranche, d'après des manuscrits inédits,' par C. Henry. Analyses et comptes rendus. Rev. des Périodiques. No. XI. Dr. Ch. Richet—'La Douleur: Étude de Psychologie Physiologique'. G. Séailles—'L'Esthétique de Hartmann' (I). Notes et Documents—'Sur l'Étude du Caractère,' par le Dr. G. de Bon. Variétés—'P. Pomponazzo et ses récents interprètes italiens,' par L. Mabilleau. Analyses et comptes-rendus. Rev. des Périodiques. No. XII. Séailles—'L'Esthétique de Hartmann' (II). D. Nolen—'Le Mécanisme de Lange'. P. Regnaud—' Études de Philosophie Indienne: L'Ecole Vedanta'. P. Béraud—'Le Moi comme Principe de la Philosophie'. Notes et Documents—'Le Sens Commun: Essai d'explication physiologique,' par F. Paulhan. Analyses et comptes-rendus. Rev. des Périodiques.

LA CRITIQUE PHILOSOPHIQUE.—VIme Année, Nos. 33-47. C. Renouvier—'Le Cours de Philosophie positive est-il encore au courant de la Science?' (33, 34); 'Le positivisme jugé par M. Huxley—Les sciences naturelles et les problèmes qu'elles font surgir' (36); 'Descartes fondateur de la physique, d'après Huxley' (40); 'La question de la mort traitée scientifiquement' (41, 42, 47); 'Examen des Principes de Psychologie de Herbert Spencer: Principes de la logique' (38), L'emploi des expressions mathématiques' (42), 'La Perception—L'origine des connaissances' (45); 'Les labyrinthes de la métaphysique: L'infini et le continu—Une évolution personelle' (44, 46). F. Pillon—'Monadisme et matérialisme' (38); 'La doctrine de Schopenhauer sur le libre arbitre: La conscience de la liberté' (39); 'De quelques objections au langage psychologique de Hume' (40); 'La classification des éléments de la connaissance selon Hume' (46, 47).

LA FILOSOFIA DELLE SCUOLE ITALIANE.—Vol. XVI. Disp. 2. L. Ferri—'L'io e la coscienza di sè'. T. Mamiani—'Della psicologia di Kant' (III. e ultimo). V.—'L'idea panteistica nell' età moderna'. T. Mamiani—'Ancora dei nuovi peripatetici secondo la *Civiltà Cattolica*'. F. Acri—'Assioco ovvero della morte, dialogo di Eschine'. N. N.—'Appunti sul Darwinismo'. Bibliografia, &c.

ZEITSCHRIFT FÜR PHILOSOPHIE, &C.—Bd. LXXI. Heft 2. T. v. Varnbüler—'Das reine Seyn: Organische Synthese oder Schema?' H. Ulrici—'Der Begriff der Entwickelung als philosophisches Princip'. E. Dreher—'Zum Verständniss der Sinneswahrnehmungen' (I.). P. Schröder—'Das Verhältniss der Causalität zur objectiven Welt'. Recensionen. Bibliographie.

ZEITSCHRIFT FÜR VÖLKERPSYCHOLOGIE U. SPRACHWISSENSCHAFT.—Bd. X. Heft. 2. H. Siebeck—'Die ästhetische Illusion und ihre psychologische Begründung. (Auf Anlass von: Volkelt, *Der Symbolbegriff in der neuesten Æsthetik.)*' J. B. Meyer—'Das Wesen der Einbildungskraft: eine psychologische Betrachtung'. W. Dilthey—'Ueber die Einbildungskraft der Dichter. (Mit Rücksicht auf Hermann Grimm, Goethe.)' Beurtheilungen.

VIERTELJAHRSSCHRIFT FÜR WISSENSCHAFTLICHE PHILOSOPHIE.—II. Heft 1. H. Siebeck—'Die metaphysischen Systeme in ihrem gemeinsamen Verhältnisse zur Erfahrung' (I). A. Schäffle—'Ueber Recht und Sitte vom Standpunkt der sociologischen Erweiterung der Zuchtwahltheorie'. Schmitz-Dumont—'Deduction des dreidimensionalen Raumes'. B. Erdmann—'Die Gliederung der Wissenschaften'. C. Göring—'Ueber den Begriff der Erfahrung' (Schluss). K. Lasswitz—'Zur Verständigung über den Gebrauch des Unendlichkeitsbegriffs'. Recensionen. Selbstanzeigen. Philosophische Zeitschriften. Bibliographische Mittheilungen.

Corrections.—Prof. Wundt wishes to have it mentioned that in his article on 'Philosophy in Germany' in MIND, No. VIII. p. 515, he erroneously ascribed to Prof. J. B. Meyer the discovery that it was the Wolffian Tetens from whom Kant borrowed his classification of the mental faculties. The discovery was made by Prof. J. E. Erdmann; see his *Grundriss der Gesch. der Philosophie*, §§ 292, 7; 301, 2. Prof. Meyer, in referring to Tetens, supposes that Kant may also have reached the same result independently.

In No. VIII., p. 576, l. 9, for *forms* read *focus;* p. 577, l. 35, for *affected* read *effected.*

No. 10.] [April, 1878.

MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

I.—NOTE-DEAFNESS.

For many years past, since the celebrated case of Dalton and the researches of George Wilson brought the subject into prominence, the common visual abnormality known as Colour-blindness or Dichroism has largely engaged the attention of physiologists and psychologists; and their observations have been of great value in suggesting new and luminous views with respect to the nature and mechanism of colour-perception. But there is a somewhat analogous auditory abnormality, which I believe to be at least equally common, yet of which I have nowhere seen any definite account. We often hear it said in conversation that such and such a person "does not know one note from another"; but most people seem to understand this statement merely as applying to a knowledge of the written musical symbols, not to the sounds which they represent. I have been led, however, to make inquiries into some such cases, and I find that the remark is literally true, in its widest acceptation, of many persons; in other words, that not a few men and women are incapable of distinguishing in consciousness between the sounds of any two tones lying within the compass of about half an octave (or even more) from one another. Upon this abnormality I have ventured to bestow the name of Note-Deafness; and I propose in the present paper to give a detailed account of one such instance, in a person whom I have had abundant opportunities of observing and experimenting upon. I need hardly point out, at the present day, the value of such special observations. All psychologists are now agreed upon the necessity for a greatly extended study of individual peculiarities: and I shall be glad if the case which I am about to detail arouses other workers to similar examinations of very unmusical persons amongst their acquaintance.

My subject is a young man of thirty, sufficiently educated to comprehend and answer in psychological terms all inquiries made of him, and with a competent knowledge of the physiological mechanism of hearing. From his youth upward he had never taken any interest in music: but it was not till a couple of years ago that he began to suspect a physical malformation as the basis of his indifference. Since that time he has been subjected to a number of experiments, and with the following results.*

If any two adjacent notes upon a piano be struck, he is quite incapable of perceiving any difference between them. After careful and deliberate comparison, many times repeated, he believes the two sounds to be exactly alike. If the same notes be sung by the human voice, he is equally unable to discriminate between them. And if one of the notes (as for example, C) be struck, and the other (D) be sung, he does not perceive any greater incongruity than when the same note (C) is both struck and sung.

Further, if any note, say C, is played on the piano, and another note at a considerable interval, say E or A in the same octave, is subsequently played, he cannot notice any difference between them. As the interval enlarges to an octave or more, as from C to C′ or A′, he becomes gradually aware of a difference in pitch. And when notes separated from one another by very considerable intervals are struck, as for example C and C″ or A″, he is conscious of a very distinct unlikeness. In short, while he can perceive variations in *pitch*, when extremely great, he cannot perceive those minor variations which constitute what we call *notes.*

Between the highest and lowest tones on a piano, he notices a very great difference: and between the middle octave and either of the extremes, he can also observe a strong contrast. But when the notes are played in succession from one end of the key-board to the other, he can nowhere perceive any distinct line of demarcation between one tone and its neighbour. Instead of the notes being separated sharply from one another in consciousness, like strips of coloured paper arranged in prismatic order, they merge indistinguishably into one another, like the colours of the prismatic spectrum itself. To him, three successive notes are not three clearly marked individual sounds, but rather resemble three pieces of blue ribbon, so nearly alike in shade that the eye cannot tell with certainty whether they are the same or not.

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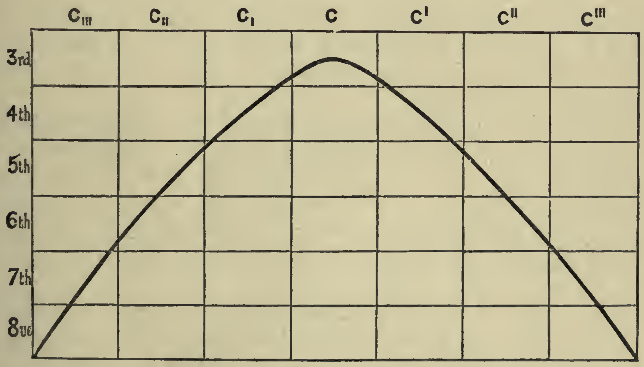
* I have to thank my friend, Mr. G. J. Romanes, F.L.S., for kind assistance in performing most of the experiments hereafter detailed, and for affording me the use of the necessary apparatus. My acknowledgements are also due to Mr. F. Galton, F.R.S., who very kindly gave me the benefit of his advice, and helped me in the performance of one valuable experiment.

This incapacity for distinguishing between tones of slightly different pitch is not, however, the same in every octave. Experiment revealed the fact that in the middle octave of an ordinary piano, my subject was able dimly to discriminate between notes having the interval of a third from one another; that in the octaves immediately above and below the middle, the utmost power of discriminating sank to a third-and-a-half or a fourth; and that in the highest and lowest octaves it required a full seventh or more to impress his ear with a consciousness of distinct difference. The following diagram roughly represents these variations of discriminativeness—C standing for the middle octave; C' C'' C''' for the octaves above; and $C_{/}$ $C_{//}$ $C_{///}$ for the octaves below, respectively.* It must be understood that, in each case, the line represents the *utmost limit* of conjectural discrimination.



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* I have been strongly urged by a scientific authority of the greatest weight in these matters to construct a regular curve with a large number of ordinates, obtained by an application of Fechner's Calculus of Uncertainty to the present case. But, in spite of the great temptation to give an appearance of mathematical accuracy by such treatment, I have decided only to draw up a rude diagram of the sort here presented. In fact, the simulation of accuracy in such a case can only be delusive. My subject has to strain his attention painfully in order to perceive any difference whatsoever at the points indicated, and his answers, even so, are never very certain.

It should also be noticed that in attempting to distinguish between varying pitches he was greatly influenced by the *volume* of sound. Thus, on a piano, where the volume could be kept pretty constant, his discrimination was more uniform than with the human voice, where differences of intensity confused him sadly. Indeed, his judgment of pitch seemed in every case to be largely supplemented by other considerations. For instance, he could recognise the notes on a piano much better than on a violin, because in the latter instrument his attention was distracted from the pure musical effect by the scraping and twanging noises which necessarily accompany the tones. So, too, in the human voice, he was misled by those inarticulate and unmusical puffs or hisses which may be perceived along with every note. Evidently his ear is far more sensitive to these non-musical noises, relatively to pure tones, than is the case with normal persons. Thus, in the highest notes on a piano, he could hear a mere thud of the hammer, without any musical tone ; and if a very shrill whistle was held close to his ear, he could only notice a puff of air, which overbore in consciousness the weak musical tone ; while he could readily detect the latter when the whistle was removed to a short distance, so as to lessen the volume of the puff. This *compensatory* sensitiveness to indefinite noises seems to serve him in place of *timbre* as a means of recognising different voices or musical instruments. A piano is, for him, a musical tone, *plus* a thud and a sound of wire-works ; a fiddle is a musical tone, *plus* a scraping of resin and cat-gut ; while an organ is a musical tone, *plus* a puff of air and an indistinct noise of bellows.

It might be supposed that mere carelessness of observation led to this want of musical discrimination. Such, however, is not probably the case. As a boy, my subject was trained to sing with the remainder of his family, but never succeeded in learning anything in the way of music. At sixteen, being unaware of the radical nature of his deficiency, he took regular lessons for some time, but was given up as incorrigible. Later on in life, he put himself to the trouble of learning the notes on the piano mechanically, in order to understand the theory of sound, and experimented to some extent with acoustical instruments. It was a series of observations made on the siren and Savart's wheels that first suggested to him the extent of the difference between his own auditory capabilities and those of normal individuals.

If a large number of ordinates were employed, they would suggest an idea of absolute certainty at each stage, which could only mislead a reader who had not himself watched the experiments.

His attempts at singing, indeed, form some of the most instructive phenomena in the whole case. He will sing "God save the Queen" with scarcely a single note correct, and even the few which coincide with the true ones seem to have come right by accident. If a scale be sung to him, and he be asked to repeat the same sounds afterwards, he will utter the articulate words "*Do, re, mi,*" &c., but run up and down the scale in a disorderly manner, singing tones which do not stand in any musical relation whatsoever to one another.

Passing from the perception of separate tones to their effects in combination, experiments revealed the fact that a discord was no more unpleasant to him than a consonance. Though he was warned, so far as language would permit, of the sort of sound which he ought to expect in a discord, he could not perceive any of that roughness or harshness which was pointed out to him. Any two notes sounded together seemed equally agreeable to him, or, to speak more correctly, equally indifferent.

In order to test his power of discriminating between harmonies and discords, he was tried with a pair of movable organ-pipes, which could be made to produce beats of any desired frequency. It was found that when the beats were very conspicuous to an ordinary ear, he heard them readily and distinguished them as interruptions of the sound: but when they were more frequent, he did not find them disagreeable, though he still cognised them intellectually as a blurring of the sound, which he compared to the buzzing of a bee: and when they sank to a mere discord, he could not observe the roughness at all, nor indeed could he clearly distinguish very rapidly recurring beats while still moderately audible as such to normal ears.

The natural interval of an octave does not affect him at all differently from any other interval. He can perceive no greater resemblance or congruity between C and C′, than between C and D′ or C and E′. In short, the whole distinction of notes, based upon numerical ratios and their corresponding nerve-fibres, is completely lost upon him; and he can only apprehend that of pitch, based upon large absolute differences of frequency.

As regards the general capabilities of hearing, my subject does not seem to differ much from ordinary persons. Several tests, both of distance and lowness, were employed, and they resulted in a conviction that his power of distinguishing non-musical sounds is up to the average, and his hearing is unusually acute. Tried with one of Mr Galton's little instruments for testing the limits of auditory impressions, he was able to hear notes quite as shrill and quite as low as most other people. For the resonance of a vibrating string and the ticking of a watch, he was rather beyond the average in acuteness. But he is a bad mimic of voices or dialects, and speaks French, to which he has been accustomed from childhood, with a decided English accent. However, as he is himself conscious of the two last-named facts, and can notice the badness of his own imitations, this defect lies more probably in the motor mechanism of speech than in the sensory mechanism of hearing.

With reference to the æsthetic results of these abnormalities, my subject is almost totally careless in the matter of music, for which he has no appreciation whatsoever. He recognises a considerable number of tunes when played or sung, but he seems to do so by the time alone. Whenever a piece specially strikes him, it is a lively air from an *opéra bouffe*, or the rollicking chorus to an old English song in which the time is strongly marked. He is equally pleased with the piece if it is played or sung out of tune, and enjoys it just as much when he sings it himself to notes of his own composition. He can distinctly appreciate, however, the beauty of a single note, struck in isolation, and perceives its æsthetic superiority to a mere noise. He likes the sound of a full and rich tone, produced by striking a finger-glass; and he is fond of church bells and chimes. He has also a delicate ear for metre in poetry, and is attracted by the music of Catullus, of Tennyson, and of Swinburne.

As to the hereditary aspect of the case, I have not been able personally to make observations upon other members of his family, but they have obligingly supplied me with the following particulars in answer to inquiries by letter. The father was quite unmusical, but not note-deaf, being able to distinguish between two adjacent notes on the piano, though incapable of observing any special relation between a tone and its octave.* The mother "is fond of music, vocal and instrumental, but does not sing or play except after a poor fashion". The remoter ancestors are described as being, on the whole, markedly unmusical. Of the children, a brother was at the same stage as the father, but exceeded him in the ability to tell when a singer was out of tune. The sisters are all more or less musical, and one of them possesses a fine voice. But it is worth notice that one of my subject's sisters had no aperture in the right ear, the auditory meatus being closed by a membrane; a fact which may possibly point to some hereditary defect in the structure of the organ. Unfortunately, no operation was ever performed upon her, so that it is impossible to say whether the internal ear was normal or otherwise. On the whole, the family is described as "in this respect only very moderately gifted".

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*His own words are, "I cannot perceive any greater likeness between the two C's than between C and B".

I have been careful thus to place before the reader all the facts of the case, unencumbered by any hypothetical explanations, because whatever may be the value of my theory on the subject, the facts themselves must possess a great interest for all inquirers into the nature of our sensory system. But I shall now venture to offer a few suggestions as to the possible physical deficiences which underlie the above-noted psychical peculiarities.

Two principal explanations may be advanced. Either the deficiency may be in the peripheral organs or it may be in the nervous centres. We may examine each hypothesis separately.

If the deficiency is in the peripheral organs, we may plausibly account for it thus. While in the normal ear each one of Corti's organs may be supposed, on Helmholtz's theory, to be tuned in harmony with a very limited range of tones—or, in objective phraseology, to be capable of vibrating sympathetically with air-waves having very nearly its own natural rate of oscillation only,—we may suppose that in the case under consideration each one of Corti's organs is badly tuned, so that it can answer to a large number of tones—or, in objective phraseology, can vibrate sympathetically with air-waves possessing a considerable range of frequency. If this view be taken, we can understand why notes lying close to one another on the gamut do not arouse differential sensations, because they would both, in that case, stimulate the same fibres; and it would be necessary to take notes whose frequencies differ widely from one another in order to stimulate separate fibres each time, and so arouse a differential sensation. Again, on the same hypothesis, we can understand why the octave is not perceived by my subject as more congruous than any other interval; because the harmonics of each note would stimulate not only the fibre ordinarily assigned to them, but also adjacent fibres, and so a fifth or a seventh would be indistinguishable from an octave. Lastly, this view accords best with the fact that my subject does not notice any superiority in a consonance over a dissonance; because, if the system of damping in Corti's organs was deficient, we may suppose that the very faint interruptions which are the cause of discord would not have sufficient duration to allow of a cessation in the vibratory motions of the organs, and these would consequently yield a continuous state of consciousness, undisturbed by that roughness which results from intermittent stimulation. The point in frequency of beats at which they ceased to be distinguishable would be, in that case, the measure of the damping powers possessed by the organs.

If, on the other hand, we assume that the deficiency exists in the nervous centres, and suppose them to be so ill-differentiated that they do not yield separate sensations for the stimulation of each separate fibre, we shall be enabled to explain all the phenomena except one, in a way that is perhaps simpler of comprehension. We may then imagine that each fibre is excited in the same manner as in normal cases, but that some ataxy of the centres prevents the stimulations from being differentially cognised. This explanation would accord well with the known phenomenon of *diplacusis,* where a single note is heard as of different pitch by the right and left ears respectively : in which case we can hardly avoid the supposition that corresponding fibres on each side are irregularly connected with non-corresponding central ganglia. But there will still remain the difficulty —why does not a dissonance produce its ordinary unpleasant effect ? I do not see how we can escape this problem, except by supposing a peripheral malformation : and as, for this particular ear, we are compelled to assume it in the one case, perhaps it is simpler to assume it as the cause in all the others.

And now I should like to point out the special bearings of this abnormality upon æsthetic questions. In the first place, the instance I have given shows how largely our æsthetic feelings may depend upon peculiarities of sensation alone, uncomplicated by emotional or intellectual differences. My subject is often " much annoyed by the imputation of bad taste " which is cast upon him whenever he says that he " does not care for music". This imputation might fairly be made if he deliberately preferred bad music to good. But, as a matter of fact, the whole sensuous basis of music is utterly blank to him. He must not be expected to admire delicate shades of expression which he literally and really *cannot hear.* Again, what we call *bad taste* means in most cases the deliberate preference for combinations which arouse low, vulgar, or common-place emotions, over those which arouse high, sympathetic, or delicate emotions : but in my subject's case, most musical combinations can evidently rouse *no* emotions at all, and so he cannot fairly be credited with any kind of taste, good or bad. I believe inquiry would reveal the fact that many others are similarly situated, but do not really know the nature of their own deficiency. Such persons are very little likely to turn their attention to questions of sound ; and it was the mere accident of the bent taken by his physical inquiries that led my subject to investigate his own case. There is therefore every reason why psychologists should hunt up these unmusical persons, and experiment upon them in the same manner as has been adopted in the present instance.

But while my subject is incapable of appreciating music, he can enter into all those æsthetic auditory feelings which are not based on the sensuous groundwork of harmony and discord. This is the case both as regards the pleasure derived from simple tones, the pleasure derived from metrical arrangement, and (to some slight extent) the pleasure derived from the higher undifferentiated emotional element in music. There is even a certain "compensatory" heightening of his gratification in the second of these instances at least.

First, as to simple tones. If we accept the theory of Helmholtz, that noises are heard by means of the vestibule, while musical sounds are cognised through the instrumentality of the cochlea, it will follow that the nerves in the latter portion of the ear, being less frequently stimulated than those of the former part, will give rise to more pleasurable sensations. This effect we might naturally expect to remain, whatever might be the peculiarities of minor organisation within the cochlea itself. And the facts in the present case exactly coincide with this supposition. All musical tones are in themselves pleasing to my subject ; and he is even able to discriminate between a rich and a poor note ; presumably because the former calls into action an immense number of Corti's organs, while the latter, though it probably rouses sympathetic vibrations in a larger area of those organs than would be the case in a normal ear, yet affects a smaller total of fibres than a note with numerous harmonics.

Next, as to the perception of time and metre. One constantly hears it said by persons unaccustomed to psychological analysis—that is to say, by ninety-nine out of a hundred educated men—"What a curious thing that So-and-so, who writes verses, or who is so fond of poetry, should not care for music !" In reality, there is very little connection between the two sources of pleasure. The one is mainly sensuous in its ground-work, and depends upon the phenomena of harmony and discord ; the other is mainly intellectual in its ground-work,* and depends partly on the fact of expectation, and partly on that of symmetrical recurrence. As my subject is unable to recognise tunes by the notes, and is consequently forced to recognise them by their time alone, his ear has been considerably trained in this direction. But the fact that the two are usually combined in music makes most people unable to distinguish analytically between them ; and they consequently express great surprise when they find a capacity to appreciate the one, without the capacity to appreciate the other. Whereas, analogy would lead us to expect that a person whose attention was never distracted by tune would become unusually discriminative of delicate effects in metre. This I believe to be the case with my subject.

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* I say "in its ground-work" in either case, because of course the higher effects of both are neither sensuous nor intellectual, but purely emotional.

Finally, as to the higher emotional element in music. Mr. Herbert Spencer has shown how the emotional expression of music is derived from the emotional expression of everyday life. But it is, so to speak, the ultimate outcome of that expression, pushed to the very highest pitch of delicate discrimination. Accordingly, we cannot expect that persons with less than average auditory endowments will be sensible to more than its broadest distinctions. And this is just the amount of appreciation exhibited by my subject. He can to some extent recognise the general tone of a piece—lively, gay, bright, subdued, tender, solemn, or majestic : but he cannot recognise those minor changes of feeling which are exhibited within the limits of a uniform composition. Of course his discrimination of the prevailing tone is largely due to time and degree of loudness ; but it seems also to be influenced to some extent by the general pitch of the piece, and by the alternations of high and low notes. And it is noticeable that while he cares very little or not at all for purely musical pieces, where everything depends upon that delicate distribution of harmonies which is to him an absolute blank, he is slightly affected by bright popular tunes, in which the emotional element is pronounced, and in which rapid and striking variations keep alive the attention by the diversity of their arrangement. To put the matter simply, he understands in music only the part that is not strictly musical. And, as might be expected, he generally speaks in a rather monotonous voice, little modulated by emotional tones.

There are two other facts in connexion with this case worth notice for their wider psychological bearing. The first is this : my subject seems absolutely indifferent to the vast mass of musical sounds. If he is engaged in mental work, and a German brass-band or a barrel-organ is grinding discord under his very ears, he is quite unconscious of the fact until his attention is called to it. He suffers much from headache ; but even in that morbid state of nerve, when noise is so intensely painful to most of us, he "would not perceive a drum-and-fife band just outside his window unless somebody happened to notice it in speaking to him". Music, in fact, under ordinary circumstances, quite escapes his observation. The second point is the converse aspect of the same peculiarity. Whenever circumstances compel his attendance at a concert, a choral service, or a musical party, where no other occupation is possible, he suffers from the most intense *ennui*, which "becomes after a time almost unsupportable". The music being an absolute matter of indifference to him, the effect is the same as if he "were made to sit quietly in an attitude of attention for two or three hours, while nothing whatsoever was taking place".

In conclusion, I should like to add that if any competent physicist or physiologist wishes to verify any of the above statements, or try any further experiments, I would endeavour to make arrangements with my subject for the purpose, on receiving a communication to that effect.

GRANT ALLEN.

II.—THE QUESTION OF VISUAL PERCEPTION IN GERMANY. (II.)

IN my first paper on this subject an attempt was made to give a rough sketch of the field of experimental research recently worked by the physiologists. The fruits of these labours have, as was there hinted, been turned to different accounts, since they have been taken up and embodied in quite dissimilar theories of the visual space-perception. In the present paper I purpose giving some account of these rival modes of interpretation, and indicating, as impartially as possible, what seems to be the relative value of these hypotheses.

It will be convenient to group these theories, after the example of Helmholtz, in two main divisions, the Innate or Intuitive and the Derivative theories; or, to adopt the German expressions the Nativistic and the Empiristic or Genetic theories. By the former are meant those modes of interpreting the phenomena which lay most emphasis on certain supposed instinctive dispositions and innate organic arrangements; by the latter those which accentuate the effects of experience, experience being of course conceived to be possible prior to the formation of the visual perception of space. The first class regard this perception more as something originally given, the latter conceive of it as a gradual process of growth or acquisition.

This division is necessarily a very rough one. The Nativists have always allowed that our visual knowledge of space owes something to experience, recollection, and inference. On the other hand the Empirist is now able, by means of the hypothesis of evolution and the law of heredity, to accept in a modified form some of the positions of the other side.

After reviewing the principal theories on the two sides, I will, in conclusion, touch on their relation to the space-problem as raised philosophically by Kant. With that problem the question between the Nativists and Empirists is, as we shall see, by no means identical.

I. *The Nativists.*

Beginning with the Nativists, we find a series of ingenious attempts to recast the innate hypothesis in accordance with the results of a progressive observation of the phenomena. We must content ourselves with considering some of the main developments of this theoretic movement.

The basis of the intuitive theory was laid by Johannes Müller,* who sought to bring the physiology of the senses into agreement with Kant's peculiar conception of space as a subjective mental form.† This he did in the case of visual perception by supposing that the retina has a direct knowledge of its own local arrangements. An impression on the retina—that is, a sensation of light—is regarded by Müller as a perception of the condition of a particular nervous fibre,‡ and the excitation of any retinal element necessarily involves the consciousness of its local peculiarities. And this perception of the local order of the various parts of the retina is all that is immediately seen in visual perception. "The retina," he says, "sees in every field of vision only itself in its spacial extension in the condition of excitation *(Affection).*" It is sensible of itself when most at rest and perfectly closed, as "spacially dark".

This primitive subjective intuition gives immediately the relations of space in two dimensions, including relative position, distance, and apparent magnitude. Only since the retinal picture inverts the real object, this subjective form does not accurately teach the property of direction (right, left, &c.). The reference of this intuitive form to external objects is regarded by Müller as an act of inference depending on recollected experience. Thus the erect position of objects, their distance, and so their real magnitude, have to be learnt. Single vision, or the combination of the impressions of the two retinas in a perception of one object in one and the same space-position, is thus accounted for by Müller. The corresponding or identical elements of the retinas have from the first the same space-consciousness. This arises from the fact that in the chiasma (the point of intersection of the optic nerves) each fibre coming from the brain splits up into two threads running to identical points. Hence the two impressions coalesce in a single perception. This is the first form of the Theory of Identity, a hypothesis which has vigorously maintained its place in German physiological speculation.

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* *Zur vergleichenden Physiologie des Gesichtssinnes*, p. 56; *Handbuch der Physiologie*, II., pp. 262, 350, 361.

† This is asserted by thinkers as different as Helmholtz and Stumpf. On the other hand, W. Tobias thinks Kant stands to Müller in the relation of a midwife rather than of a father. (See *Grenzen der Philosophie*, pp. 106, 107.)

‡ This is pointed out by Ueberhorst, *Die Entstehung der Gesichtswahrnehmung*, p. 129.

Müller's way of regarding the visual intuition of space as subjective or retinal has been adopted by only a small number of his followers. Some of the physiologists who immediately succeeded him endeavoured by means of it to explain certain of the more intricate facts of vision. Thus, for example, Recklinghausen ingeniously argued that the discrepancy between the apparent and the real right angle arises from the fact that the surface of the retina and the axis of vision meet obliquely, and as a consequence of this the optical images of the lines containing a right angle in the retinal image could form an oblique angle. A curious development of Müller's theory of retinal perception appears in the doctrine of Ueberweg* that the magnitude which we attribute to our retina, after the analogy of the image of the retina of other persons, does not constitute its true circumference; that this latter rather coincides with our whole field of vision; and that, conversely, the apparent magnitude of an external object is in reality only that of its actual retinal image.† A survival (in a modified form) of this subjective theory will be found in the doctrine of monocular space-perception held by Hering and Kundt, of which I shall speak presently.

It may be supposed that this notion of a subjective or retinal form of space which has to be referred to external objects by help of experience, would not permanently satisfy the nativists themselves. It would seem more natural and consistent to extend the innate capacity of the retina by attributing to it an original perception of the space external to itself; and this was done by means of the Theory of Projection ‡ which was maintained in Germany by Tourtual, as also by Volkmann in one of his earlier works. According to this hypothesis the retina has an innate capability of projecting its impressions outwards in the divisions of certain straight lines, as the axes of the impinging pencils of rays.§ This theory was clearly an extension of the idea that space is originally seen, since it makes instinctive the perception of direction and of the erect position of objects which Müller had regarded as acquired. According to this hypothesis objects are seen single, not because their images fall on identical points, but because the rays impinging on the two retinas meet in the object which emits or reflects them.

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* *Zeitschrift für rationelle Medicin*, Vol. V., pp. 268-282.

† This bold idea is criticised by Stumpf, *Ueber den psychologischen Ursprung der Raumvorstellung*, pp. 191, 192. Mr. Monck appears to put forward a doctrine of a perception of the retina not very different from that of Ueberweg, *Space and Vision*, p. 34 ff.

‡ This is Wundt's name for the theory (*Physiol. Psychologie*, p. 632). Helmholtz uses the expression to denote the empirical doctrine that impressions are referred to points of external space by help of certain mental processes, as distinguished from the hypothesis of identity (*Physiol. Optik*, p. 441).

§ Or the lines of vision (*Visirlinien*), *i.e.*, the normals passing through the centre of curvature which nearly coincide with these axes.

A closer study of the phenomena of binocular vision showed that both the Theory of Identity and that of Projection in their earlier form were beset with insuperable difficulties. It is obvious that the latter fails to account for the presence of double images. If the retinal images are through an innate tendency projected in the direction of the rays or lines of vision, we ought (as Wundt observes) to see everything single under all circumstances (since the rays always intersect in the luminous point). This difficulty was felt by Nagel, who endeavoured to modify the theory. According to him the two retinas are projected independently on different spherical surfaces, having the points of intersection of the lines of vision—approximately the centres of the eyeballs—as their centres. These surfaces intersect in the point of fixation; and in the case of vision with parallel axes, meet in a single plane.* While the Projection-theory accounts for the coalescence of the retinal images but not for the facts of double vision, the Theory of Identity, though explaining in the main the facts of double vision, fails to clear up the phenomena of single vision in the case of disparate (non-identical) points. Brücke† attempted to obviate this difficulty by saying that the coalescence of impressions in these cases may be effected by ocular movements which successively bring all points of the object on the identical centres of the yellow spots (points of fixation). This supposition was plainly disproved by the experiments of Dove with momentary electrical illumination.‡ (MIND No. IX., p. 22.)§

A further modification of the Theory of Identity had therefore to be made before it could be accepted as an adequate interpretation of the facts. This has been attempted by one or two recent writers with very considerable ingenuity, and a fine appreciation of the complexity of the phenomena needing explanation. I refer more particularly to the hypotheses put forth by Panum and E. Hering, who not only seek to bring the

* Nagel called this process of projection a "constructive" operation. He took a considerable step in the direction of the Empiristic hypothesis by affirming that this projection took place by help of the muscular feelings. See his work, *Das Sehen mit zwei Augen*, pp. 5, 99 ff.

† Müller's *Archiv*, 1841, p. 459.

‡ *Berichte der Berliner Akademie*, 1841, p. 252.

§ Further references to my previous article will be made under the form No. IX.

hypothesis of Identity into agreement with the results of recent research, but carry out the nativistic method yet more consistently by attributing to the retina an innate perception of distance, or the third dimension of space.

Panum* accepts so much of the hypothesis of Projection as to refer the perception of height and breadth (two dimensions of space) to an innate and specific mode of feeling the relation of the single retinal points to their lines of projection.† At the same time he accepts and modifies the hypothesis of Identity by saying that with every point of the one retina there is co-ordinated from the first, not simply an identical point, but a corresponding circle of sensation *(Empfindungskreis)*. When identical points are excited we *must* see single; with corresponding points (those contained in the corresponding circle) we *may* see single. What determines whether this coalescence shall take place in the case of corresponding points which are non-identical, is the presence in the circle of sensation of a contour resembling that of the given point *a* of the other retina. At the same time different feelings of depth or distance would arise according as the point *a* combined with this or that point of its circle of sensation. This perception of depth or solidity is called by Panum a sensation or synergy of "the binocular parallax".‡ By means of these innate capabilities of the retina Panum seeks to cover the intricate phenomena of the limits of single vision, and the perception of relief (No. IX., pp. 18-22). In addition to these innate capabilities or energies of the retina, he postulates "a binocular energy of colour combination," by help of which two colours seen binocularly are able to mix, and also "a binocular synergy of alternation," which is to account for the phenomenon of non-combination or rivalry of the two fields (No. IX., p. 23). In this way Panum endows the retina with quite a wealth of distinct innate powers. He may be taken as the most consistent and courageous representative of the nativistic hypothesis.

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* *Physiologische Untersuchungen ueber das Sehen mit zwei Augen*, pp. 59, 82 ff.

† This is said to arise out of "a definite co-ordination and quality of the nerve-elements of the central region of the opticus".

‡ By the expression "binocular parallax" is meant the circumstance that an object point lying behind or before the point of fixation will project its image on points of the two retinas unequally distant from the centres. The effect of this may be either a perception of double images, or one of relief or solidity. The stereoscopic arrangement imitates this, by causing the image of a nearer or more distant point of the scene to fall on the two retinas at unequal distances from their centres instead of on corresponding regions.

The peculiar theory by which E. Hering* attempts to interpret the facts of visual perception may be looked on as the most able and convincing presentation of the nativistic point of view. It allows more to the empirists than Panum's hypothesis, and by carefully marking off the region of innate perception and empirical acquisition, seems at first sight well fitted to resolve the difficult questions here at issue.

Hering's theory sets out with the conception of an original and purely sensuous form of space, which has to be filled in and completed by elements of experience. This space is not subjective in the sense of Müller's doctrine that the retina has an original knowledge of its own local arrangements and spacial dimensions. It is from the first intuited as a form or mould into which objects may be projected. It is true that, when dealing with the construction of the monocular field, Hering argues as though the retina had a direct consciousness of its own spaciality; yet, as Helmholtz points out *(Physiol. Optik,* p. 594) this idea appears to stand in direct contradiction to his main theory as expounded in connexion with binocular vision.†

According to this main theory, the original sensorium has consciousness, but not self-consciousness. It *feels (empfindet)* light and space, but does not place itself over against that which is felt as an ego. Hence it does not see things in this or that (absolute) direction, since direction pre-supposes a reference of all space-relations to an ego as a centre. We can only speak of the spacial relations which objects have among themselves in this original subjective visual space. As, however, there must be some starting-point to which all spacial relations have to be referred, we may most conveniently select the main point *(Kernpunkt)* of the field of vision, that is, the point which answers to the centre of the yellow spot of both retinas. This point has no definite place, and can, like every other point of the field, only be spacially determined in relation to other points simultaneously felt.*

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* *Beiträge zur Physiologie.* The theory is summed up in section 124. Some of its positions are adopted by Mr. T. K. Abbott in his *Sight and Touch.*

† Hering introduces this idea of the retina's knowledge of its own spacial relations in order to explain the illusions of the single eye in the estimation of linear magnitude, &c. (See No. IX., p. 9.) He supposes that the eye measures the distance of two retinal points, not according to the length of the retinal arc, but according to that of the chord. This becomes shorter —in relation to the arc—as the distance of the two points increases. Hence the excessive estimation of a divided, as contrasted with an undivided, line, of acute as contrasted with obtuse angles, and so on. This theory, which is also maintained by Kundt, is well criticised by Helmholtz, *Physiol. Optik,* pp. 571-2, and by Wundt, *Physiol. Psychologie,* p. 569.

The images of the various retinal points group themselves about this main point by help of certain "space-feelings". Every retinal point has first of all a peculiar value of height and breadth (two dimensions) which increases with the distance of the point from the centre of the yellow spot, and which is of an opposite nature in the case of points above and below, to the right and the left of this point. These feelings of height and breadth constitute "the feeling of direction" for the place in the common field. Identical points have the same values. In this way the retina is able to order its impressions in two directions.

In addition to these two "space-feelings" there is a third—namely, the feeling of depth. This feeling is of equal but opposite value in the case of identical points, so that their combined value is zero. Symmetrically lying points of the two retinas are in all respects equivalent. The value of the inner retinal semicircles is positive—that is, answers to greater depth or distance; that of the outer semicircles is negative, answering to greater proximity.† Identical points, having the depth-value zero, appear through an immediate act of sensation in a plane called the main surface in the field of vision.‡

This surface has at first no definite distance. There is in this primitive vision of space no reference to far and near. This arises only after the mental image *(Vorstellungsbild)* of our own body is on every occasion "built" into the visual space. This same recognition of the body as a starting-point in visual space is the basis of the sense of direction (absolute direction) which, as Hering himself has shown (No. IX., p. 13), is estimated as diverging or radiating from a point lying midway between the centres of the two eyes.§

At the same time Hering allows much to the influence of later acquisition in rendering precise the perception of distance.* So, too, he recognises the effects of experience in the combination of the images of disparate retinal points in single perceptions. Herein he differs from Panum. He seems to hold, however, that with growing practice in attention double images might be distinguished where they now appear to the ordinary observer as inseparable.

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* Hering distinctly says that in this subjective space we have nothing to do with "absolute determinations answering to real space," but only with "relations of single points among themselves".

† The meaning of this will be seen by a reference to the fact that if a given point *a* is fixated, a point *b*, lying behind *a*, will project its images on the two inner halves of the retina, while another point *c*, lying in front of *a*, will be imaged on the two outer halves.

‡ The only points which have the same values of height, breadth, and depth, are those lying in the middle longitudinal (vertical) section of the retinas.

§ Before this representation is added, the eyes see in parallel directions. The representative image of the body is of course itself visual. Hering thinks it is only a want of imaginative power which prevents us from adding a complete intuition of our body to the visual field as we do in dreaming.

Only one other theory on the nativistic or intuitive side needs to be dwelt on here. This is the doctrine of visual space recently unfolded by Stumpf in his able and interesting volume, *Ueber den psychologischen Ursprung der Raumvorstellung.* Stumpf's work is largely critical and polemical, and his own theory is given rather as a supplement to his systematic discussion of the various rival hypotheses. Moreover the author is not, like the writers just enumerated, so immediately concerned with an interpretation of facts reached in a special department of scientific research, but rather aims at giving greater philosophic precision to the problem of our space-knowledge. Nevertheless, since it is so closely related in its main features to some of the preceding nativistic theories, it will be well to include it in our present review.

Stumpf holds firmly to the notion of an original sensuous space. He is, further, very clear as to the non-existence of any original knowledge of retinal space. Extension and quality (light, colour) are "psychological parts"—that is to say, inseparable—and so "partial contents," and are to be contrasted with "independent contents," which may be separated. The presentation of space in two dimensions (*Flächenvorstellung*) is original or intuitive, though it depends on certain physical causes or stimuli. Thus, instead of Lotze's acquired mental local signs (*vide infra*) he would postulate certain physical local signs—namely, the local separation and order of the nerve-fibres themselves.

Depth or distance (third dimension) is directly felt in sensuous intuition like the other two dimensions.† It is originally felt by the single eye, and not first by the two eyes. Like the other dimensions too, it has its physical causes or stimuli. Respecting these stimuli, Stumpf expresses himself with considerable diffidence. He seems disposed to allow most weight to the circumstance of accommodation, which may, by altering the degree of tension of the retina, modify in some way the optical nervous process. According to this view we see originally a distance which varies with the degree of accommodation. Yet Stumpf does not finally decide between this hypothesis and that of an original intuition of some single distance (adopted by Hering). For the rest, he allows a large part in the development of our mature perception of distance to those elements of association (distinctness of image, feeling of convergence, &c.), on which the Empirists are wont to insist (see p. 217 ff.).

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* Nevertheless he altogether rejects the idea that this is assisted by any kind of motor feelings, the existence of which he denies.

† Stumpf has an elaborate argument in favour of the proposition that distance is originally given in visual sensation. One of the reasons urged is that the perception of a surface, since it involves two sides, must also involve depth of distance.

Among the circumstances which thus determine or render precise the perception of distance is that of binocular parallax. This physical element affects consciousness by partially or completely separating the retinal images of a point lying before or behind the point of fixation. The conscious feeling thus arising (either a sense of confusion in the image or a perception of distinct images) is associated with the idea of a definite distance through the representation of a certain alteration in the mode of fixation.

But now comes a difficulty. If we first present to the eyes a concave surface, and then its obverse convex side, or if we exchange the two stereoscopic pictures of a concave surface, the retinal images of the points about the centre (fixation-point) will fall in the second case on regions of the two retinas exactly corresponding to the regions affected in the first instance.* Yet we are at once able to say, even with a momentary electric illumination, whether the points are nearer or further than the centre of the object fixated. Why should these two composite impressions be distinguished at all, seeing that pairs of corresponding points are affected in the two cases? Further, how is it we know that this difference is one of before and behind the fixation-point? Stumpf answers the first of these questions in the same way as Helmholtz by saying that the impression of the one retina is or may be consciously distinguished from that of the other. The second question he answers by help of the following hypothesis, which is essentially the Projection-hypothesis as modified by Nagel:—Each retina from the first projects its images by an immediate act of sensation on a spheroidal surface (concave) lying at a certain distance.† The two surfaces intersect in the point of fixation. As a consequence of this we are able to give a different place (namely, one before and behind the fixation-point) to the double images arising in the two cases just described. What the difference of distances between the two points thus distinguished actually amounts to must, of course, be learnt by means of the associations already referred to.

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* That is to say, a point p will in the second case image itself on a point of the left retina exactly corresponding to (that is, equi-distant from its retinal centre with) the point of the right retina which received the image of p in the first case. Similarly with respect to the point of the right retina excited in the second instance.

† One must suppose this to be given by the degree of accommodation (see before).

With respect to the much-vexed question of single and double vision, Stumpf follows closely in the wake of Hering and the other advocates of the Theory of Identity. Like Hering, he appears to think that the power of recognising double images may be indefinitely increased by exercise. He allows, further, a considerable part to the imagination, as guided by past experience, in the fusion of the impressions of disparate (non-corresponding) points. Stumpf thinks there must be a physical cause for this identity of localisation, and he is inclined to content himself with the bare fact of the local similarity of the corresponding fibres, leaving undetermined the question whether they preserve their symmetrical position throughout their course, or even become united in single fibres (as Müller assumed).

Fully to criticise the theories here roughly outlined would require too much time. It may be well, however, to mention two or three principal objections to which the nativistic hypothesis, in the several forms in which it has so far presented itself, appears to be specially exposed.

(a) First of all, then, it has not, in the judgment of such trained observers as Helmholtz, Wundt, and others, fulfilled the first conditions of a scientific hypothesis, by reconciling itself with all the ascertained facts.* Thus, for example, Helmholtz brings forward as an objection to Hering's doctrine—that we measure linear magnitude by the chord which unites the two extreme retinal points affected—the fact that the illusions to be explained by this curious hypothesis occur just as certainly when the difference between the length of the chord and of the arc is no longer distinguishable *(Physiol. Optik*, p. 572). Again, the theory of Identity cannot be said to have adapted itself to the fact emphasised by Helmholtz, that not only the images of disparate points sometimes coalesce, but those of corresponding points are sometimes seen double. The circumstances called in to explain these discrepancies (want of attention, inaccurate fixation, &c.), do not, in the light of the collective evidence, appear

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* It must be allowed, however, that the testimony of different observers respecting facts is far from being as uniform as one could wish. To give a single instance: Helmholtz asserts that vertical magnitudes—*e.g.*, the height of a mountain—appear greater when seen indirectly on the confines of the field than when viewed directly. Classen in his last work (*vide infra*) denies this, and maintains exactly the reverse. Objects are said to look smaller, and especially shorter, in indirect than in direct vision.

to be at all as influential as they are here represented. Once more, Helmholtz and Wundt urge against Hering's hypothesis of feelings of depth, that according to this theory the double images of a side-point at a distance from the observer unequal to that of the point of fixation ought to appear at different distances, whereas Hering himself admits that this is not so as a rule.*

(b) In the second place, it may be objected to this hypothesis that it is beset with certain inherent difficulties. Thus, in each of the forms it assumes above, it postulates the existence of an innate intuition which is in its nature very hard to conceive. How, for example (to take Müller's form first), is the mind to intuite the spacial relations of the retina, except it has at the same time some vague knowledge of the space beyond? or how are we to conceive Hering's *Kernfläche* lying at a wholly indefinite distance? The difficulty in the case of Hering's doctrine is even greater probably than in that of Müller's hypothesis. In truth, Hering's hypothesis appears to involve the fallacious assumption that there can be an idea of distance in general apart from particular distances.†

(*c*) Again it may be asked how we are to conceive the relation of this primitive perception or "sensation" of space to the later and acquired perception which is incorporated into it. It appears to me that in this respect, too, the later developments of the Nativistic hypothesis have rather increased than diminished the difficulty. If the mind has originally a knowledge of a circumscribed section of space (retinal space), we may perhaps understand how it learns to extend this presentation, just as a child can easily go on to understand months and years if it starts with a clear idea of days. But how are we to conceive the indefinite space-feelings of Hering expanded into the clear and determinate perceptions of the mature organ? or how imagine Stumpf's perceptions of the spheroidal surfaces taken up, so to speak, into our ordinary intuitions of distance? There must surely be something in common between the original and the acquired factors in this composite perception of distance. But if so, is it not a little improbable that the original element is wholly distinct and *sui generis?*

Just as it is difficult to conceive the acquired element combining with and giving substance, so to speak, to the original sensuous element where the two do not interfere with one another, so it is difficult to understand how so much of the primordial intuition becomes overpowered by the added factors when these admittedly clash with the former. Helmholtz lays great emphasis on the fact that according to the concessions of the Nativists the original intuition is constantly overpowered by elements of association.* He disputes the assertion that sensations can ever be thus displaced by associated representations.† At least we may, as he remarks, naturally expect that the original intuition (*e.g.*, that of double images) should persist, even as an illusion.

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* Helmholtz argues, too, against Nagel's hypothesis of Projection that there is in reality no such distinct perception of the different distance of the two double images as this theory requires. The same objection would appear to apply to Stumpf's modification of this hypothesis. (Wundt just refers to this last as identical with Nagel's.)

† Stumpf of course escapes this difficulty by assuming that one particular distance is felt in every case, answering to the state of accommodation.

(*d*) Lastly, supposing that this difficulty of co-ordinating the original intuition and the subsequent acquisition could be surmounted, it would still be an objection to this theory that the primordial visual intuition here assumed is a pure supposition, of the real existence of which we have not the least evidence, when we might reasonably look for such, and which is constructed solely for the purpose of accounting for the facts. This objection applies to Hering's notion of a *Kernfläche*, and to Stumpf's hypothesis of spheroidal surfaces, as well as to Müller's doctrine of an original perception of the retina itself,‡ and to the curious array of innate cognitions attributed to the retina by Panum. All such hypotheses are in their nature too fanciful to supply an adequate scientific solution of the problem. At least we have no business to resort to them until we are certain that known facts and laws are unequal to the task of solving this problem. This is the position taken up by the Empirists, and we have now to inquire how far they have succeeded in accounting for the phenomena by help of known physiological and psychological processes.

II. *The Empirists.*

The common basis of principle adopted by the Empiristic or Genetic method may be briefly summed up as follows:—Space is not, as the Nativists say, originally seen (like colour). It is a mental growth or acquisition, depending on a number of elementary experiences. Among these the feelings which accompany the action of the ocular muscles play the most important part. The locality given to the impressions of the various retinal fibres is not original, but is built out of motor experiences. The impressions of the two retinas are not inseparably connected by any innate anatomical arrangements, but are originally distinct, and combine only under the influence of experience. The visual perception of spacial relations, though mediated by certain ocular feelings, includes associations with extra-optical facts. This is especially apparent in the case of direction in relation to our body and of distance.

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* See his able criticism of the Nativistic Hypothesis (*Physiol. Optik,* pp. 441, 442; *cf.* Wundt, *Physiol. Psychologie*, pp. 636, 637).

† I do not here examine the worth of this statement. It has been ably criticised by Stumpf. (See my *Sensation and Intuition*, p. 67.)

‡ The idea of an instinctive projection of the retinal images in the direction of the rays or lines of vision appears to me to be simply an extension of Müller's theory that the mind (apart from objective observation of other eyes) knows immediately what takes place within and without the organ in the process of visual stimulation.

While there is this general agreement in the method pursued, there are not wanting numerous points of difference. These will emerge in the consideration of the particular systems. Some are comparatively unimportant, as the exact nature of the muscular feelings, or the extent to which actual movement enters into visual estimation (No. IX., pp. 7-9). Others again are more important, as, for example, the question how the retinal elements reach their developed local sensibility, and what may be the nature of the mental process by which our space perceptions are formed. A still more vital point is, how far the visual perception of space is assisted by certain innate dispositions.

The empiristic line of investigation can be traced back beyond Johannes Müller. As early as the year 1811, Helmholtz tells us, an attempt was made by Steinbuch *(Beiträge zur Physiologie der Sinne)* to deduce the phenomena of space from the movements of the eyes and the body. The resumption of this mode of inquiry after the influence of the Kantian philosophy on physiology was itself due to a new philosophic influence. It was Herbart's peculiar theory of space which gave the impulse to recent empirical investigation. According to this theory, which sets out with the unity of the mind, all presentations *(Vorstellungen)* are successive, and only become ordered in the form of space when they constitute a reversible series. Herbart at the same time regarded movement as an essential factor in the development of the space-intuition. Hence under his influence physiologists were led to set out with the idea of an original qualitative difference of sensations only, and to construct the perception of space out of motor experiences.

The empiristic or genetic direction in the domain of physiological optics has been followed more or less fully by a considerable number of writers, including among others Volkmann, Meyer, Lotze, Cornelius, Nagel, Classen, Wundt, and Helmholtz.*

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* Not that these are all to an equal extent empiristic. The presence of nativistic elements has already been shown in the case of Volkmann and

I do not intend to give an account of the particular form of the Empiristic doctrine propounded by each of these writers. It may suffice to select three who have done most to develop the empirical view, and whose speculations have had the greatest influence. I refer to Lotze, Helmholtz, and Wundt.

Lotze * set himself more especially to discuss the problem how we come to order the sensations of colour in the superficial field of vision. This problem is that of Herbart, and was discussed by Waitz and Cornelius before Lotze.† By these the question was answered with the help of Herbart's doctrine of the unity of the mind. This metaphysical basis is dispensed with by Lotze. He departs from the Herbartian stand-point still further in that he rejects the theory that a perception of spacial relations (the coexistent) can arise out of a reproduction of serial or successive feelings.‡ Lotze does not attempt to explain how it is that the mind is compelled to construct its intuition of space. He only seeks to indicate the means by which this is effected. These he finds in certain feelings connected with the muscles. In thus deriving the local discrimination of the retina from motor experiences, Lotze clearly places himself at the genetic or derivative point of view, even though he will not allow that our perception of space is a pure product of such simple experiences.§

Lotze thus explains the process by which the eye learns to

Nagel. Classen has done much to work out the derivative view; nevertheless, in a recent work (*Physiologie des Gesichtssinnes zum ersten Mal begründet auf Kant's Theorie der Erfahrung*, 1876) he attaches himself to the Kantians. Wundt speaks of Volkmann and Classen as occupying a middle position between Nativism and Empirism.

* Lotze's theory of tactual and visual localisation is found in its earlier form in his article, 'Seele und Seelenleben,' in R. Wagner's *Handwörterbuch der Physiologie*, and in his *Medicinische Psychologie*, Book II. p. 328 *seq.* More recent utterances are to be found in a communication printed as an appendix in Stumpf's volume, and in an article headed 'De la formation de la notion d'Espace' in the *Revue Philosophique* (October, 1877).

† Lotze's historical position is clearly indicated by Ueberhorst, *Die Entstehung der Gesichtswahrnehmung*, p. 161 ff. His doctrine is sharply distinguished from that of Herbart and of Waitz by Wundt. (*Op. cit.*, pp. 493, 494.)

‡ His chief argument is that were it so, we should give a space-order to our sensations of tone (in singing the scale). The same argument is developed by Stumpf as an objection, not only to Herbart's theory, but also to that of Professor Bain. (*Op. cit.*, pp. 33 and 55.) It is also adopted by Wundt. (*Op. cit.*, p. 494.)

§ Lotze tells us these local feelings are not the causes, but only the occasions of the mind's construction of space, which involves in addition to these the mind's own activity. Stumpf speaks of Lotze's local signs as 'psychic stimuli.' The notion that the mind exerts a unique activity in the formation of the space-intuition out of motor feelings is adopted by Ueberhorst who postulates the existence of a 'locating activity' (*ortsetzende Thätigkeit*).

localise its impressions: "Every stimulus a effects first of all a sensation α which changes into another β, when the quality of the a passes into another b; but besides this, every stimulus excites a second sensation ν, which is dependent on the point excited N, and which changes into π if N passes into P, or more correctly, if the stimulus wanders from the point N to the other point P. Accordingly, every impression which is to undergo a localisation, is to be regarded as an association of two impressions, which disturb one another just as little as two associated representations mutually modify their content".

The question now arises wherein consists this added sensation ν, which is called by Lotze the 'local sign' of a sensation. This is not derived from the nature of the particular retinal point N excited, but from its connexion with the system of ocular muscles, and the reflex movements which are thus produced. The excitation of a given retinal point is organically connected with that particular combination of muscular actions necessary for bringing this same stimulus on the centre of the yellow spot.

The further question arises whether these local signs are physical or mental? Lotze had first of all (*Med. Psychol.*, p. 350) described them as 'impulses' (or 'tendencies') to an actual movement of the eye. This expression was criticised by Stumpf; and in his latest utterance Lotze distinctly calls them 'feelings of movement'. In the eye of the new-born child the stimulation of a particular point in the outlying region of the retina is followed by the actual execution of the appropriate movement. This movement produces a definite feeling of movement, which cannot be further defined except by saying that it is a mode in which we are affected ("eine Art wie uns zu Muth ist"), and which differs from other modes when other movements are carried out.* In later life, when two or more points are simultaneously stimulated with equal strength and consequently no movement follows, the feelings of movement previously experienced cling to the impressions. In this way the eye learns when in a state of repose to localise the various impressions which fall on the retina.

These local signs compose a graduated system corresponding to their respective movements. If we think of the retina as a circle, then for all points which lie on the same radius the quantity of movement towards the centre will be different; for all points equidistant from this centre, but lying on different radii, the direction of movement will vary; for points on different radii and at different distances from the centre, both the quantity and the direction of the movement will vary. The feelings of movement vary in quantity and quality according to the magnitude and direction of the movements, and consequently exactly correspond to these last in the case of the various retinal points.

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* Lotze supposes that the action of a given muscle (or set of muscles) is somehow distinguished from that of others, though he objects to the idea that an adequate cause of this difference in feeling is the local separation of the muscles and motor nerves.

While Lotze has thus made use of the feelings of movement to account for the monocular construction of space in two dimensions, Helmholtz,* gathering up the results of many previous workers, has sought to apply a similar method of resolution to all departments of vision. More than this, Helmholtz is not, like Lotze, hampered with any metaphysical presuppositions respecting the nature of the soul. He follows the empirical psychology of J. S. Mill rather than the metaphysical psychology of Herbart.

Helmholtz sets out with the proposition that our sensations are for our consciousness signs, the meaning of which is left to be learnt by our understanding. Thus through experience we learn what impression an object which we see would make on our eye or other organ of sense, if we were to move the eye or body. The sum of all these possible sensations is our presentation (or representation) of the body. The only psychical activity required is that known as the reproduction of associated ideas. This conception accounts equally well for the correct perceptions of objects in normal circumstances, and also for those illusions which arise when impressions are produced in an exceptional way, *e.g.*, by pressing on the back of the eyeball, or by covering the eye with prisms (No. IX., pp. 12, 13, 15). Since this transition from sensation to associated idea is capable of being unfolded and expressed as an act of inference, while at the same time (in our mature minds at least) there is no distinct consciousness of the elements of immediate sensation and mediate representation, we may speak of the process as an "unconscious inference".†

The feelings which lie at the basis of the visual perception of spacial relations are first of all those which depend on the part of the retina stimulated. These are the local signs. They differ altogether in the two retinas. Respecting their exact nature Helmholtz does not think it needful to express himself. He simply says they need not be arranged in a graduated system, as Lotze supposes, but might be promiscuously distributed in any way whatever.

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* The theory of Helmholtz is unfolded in various parts of his work *Handbuch der physiologischen Optik*, see especially § 26 and § 33. See also his *Populäre wissenschaftliche Vorträge*, Second Series, p. 63, ff.

† Helmholtz seems to me to be misrepresented when he is made to say that such processes actually take place as inferences in the unconscious regions of the mind. All that his words involve is, that these unanalysable acts are susceptible of being expressed as inferences.

Besides these local feelings of the retinal fibres, there are those which accompany muscular activity. Helmholtz here distinguishes *(a)* the consciousness of the intensity of our volitional effort, or the degree of innervation; *(b)* the feeling of the tension of the muscles, that is the force with which they strive to work; and *(c)* the consciousness of the result of the effort (shortening of the muscle, altered tension of the contiguous parts, &c.). He makes most use of the first order of feelings.

Our monocular knowledge of space in two dimensions arises through the co-operation of movement (No. IX., pp. 5-7). These movements follow definite laws, not because of any innate anatomical arrangements (as is proved by the possibility of deviating from the normal combinations, though there may be an inherited tendency to follow out these combinations as the most easy. By help of these movements the eye learns the order of the points in the field of vision, that is to say, " what local signs of the sensations correspond to the points which are immediately adjacent to one another". In other words, after moving the eye over objects and afterwards fixating them, we ascertain " how two points which we have learnt by movement to be adjacent are represented in the motionless image of the eye".*

The localisation of impressions is thus definitely referred to certain feelings in some way connected with the stimulation of the various fibres. Helmholtz warns us, however, against supposing that the monocular field is constructed by a summation, so to speak, of the characteristic feelings of the nervous elements as though they constituted units of superficial space. He points to the fact that in the case of the retina, like that of the skin, the smallest distinguishable magnitudes (as determined by a bare discrimination of points) do not appear equally great at all parts of the sensitive surface.

In this way the relative position of points in any section of the visual field viewed at one moment is ascertained. In order to determine absolute direction, that is the direction of any given section of the field and its objects in relation to our body, the feelings of innervation (effort of will) must co-operate. This is proved by the facts of paralysis, giddiness, &c., already referred to (No. IX., pp. 10, 11).† The judgment reposing on these feelings must, however, be constantly controlled by the result, that is, the transposition of the retinal images which follows the innervation. Helmholtz explains the visual perception of distance (monocular and binocular) much after the manner of English associationists.

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* The meaning of this might be clearer. It seems to imply that the original local discrimination only becomes effective when associated feelings of movement (Lotze's local signs) are superadded.

† According to Helmholtz, these facts prove conclusively that it is the feeling of innervation, or volitional strain, and not any feeling attending

He thus accounts for the complicated phenomena of double and single vision. The *sensations* of the two retinas are perfectly distinct from one another. They combine in single *perceptions* only when, owing to a predominance of associations, they stand as signs of single objects. This accounts for the normal coalescence of impressions of corresponding or identical points, for the fusion of the impressions of disparate points in the perception of relief, and for the alternation of visual impression when the two fields are made quite dissimilar (rivalry of fields). Lastly, since this binocular perception is resolvable into an inference from past experiences, we are able to understand the variations which occur in the observation of double images, and of the rival fields, under the influence of a more or less vivid imagination and strenuous act of attention.*

If Lotze represents empirical psychology, burdened with survivals of Herbart's metaphysics, and Helmholtz empirical psychology in its older form as taught by the Mills, Wundt may be taken as representing this same psychology as enlarged and corrected by the addition of the ideas of racial experience and inherited acquisition. In thus taking his stand on the doctrine of evolution, he is able to mediate between the nativists and empirists.

Wundt† separates himself from Helmholtz and the English associationists on the following grounds: (1) In our visual perception of space we are said to infer from facts of past experience. But apart from the difficulties attending the conception of 'unconscious inferences,'‡ the question still remains how such

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the tension or actual contraction of the muscles, which is the basis of this sense of direction.

* Helmholtz adds (*Populäre Vorträge*, 2nd Series, p. 86) that, since the similarity of localisation of corresponding regions of the two retinas does not rest on sensation, the original comparison of different linear magnitudes in each separate field cannot repose on immediate sensation. It is a little curious to find Mr. Abbot (*Sight and Touch*, p. 48) saying that single vision has never been explained on the derivative theory, without making any reference to Helmholtz's elaborate argument. This is the more remarkable as Mr. Abbott draws largely on the Germans, and even extracts two or three facts from Helmholtz's great work.

† I have confined myself here to Wundt's last and principal work, *Grundzüge der physiologischen Psychologie*.

‡ In an earlier work, *Vorlesungen über die Menschen- und Thier-Seele* (p. 58 ff.), Wundt himself distinctly accepted the idea of the logical or inferential character of the process in the perception of space-relations, and conceived this process as extra-mental or unconscious.

pre-spacial experience (whether visual or tactual, &c.) is possible. The doctrine of Helmholtz requires the supposition of an innate spacial interpretation of tactual sensations, and if this is so, it is hard to see why the same is not to be assumed in the case of the eye. Wundt is thus in favour of an independent knowledge of space-relations by the eye. (2) He objects, to the term 'association' for the process by which the space-perception arises. Association has to do only with representations which can be consciously distinguished, whereas our perception of space is made up of a number of *sensations* which fuse in a new and apparently simple mode of consciousness. The term Wundt adopts for this process is 'synthesis'.

Wundt's theory takes its start from Lotze's idea of local signs, only he thinks the differences in the feelings of ocular movement are inadequate to account for our construction of spacial extension. To these active feelings must be added certain passive sensations which constitute the real local signs of the several retinal elements, and through the coalescence of which with the active feelings the extensive form of the visual field arises.*

The local signs of the retina were found by Wundt in an earlier work (*Beiträge zur Theorie der Sinneswahrnehmung*, p. 145, ff.) in a certain 'local colouring' of the retinal sensations, that is to say, in the qualitative peculiarities of the sensations depending on the region of the retina affected.† In his latest work, however, with which we are here concerned, he attaches less importance to these,‡ and lays most stress on the sensations of touch which accompany ocular movements and depend on the varying pressure exerted on the sensitive parts of the orbit.

With these sensations are combined certain motor feelings, namely, those of innervation which accompany the process of central innervation in the act of moving the eye to the particular point indicated by the retinal impression. These feelings, unlike Lotze's 'feelings of movement,' are said to differ in their degree of intensity only, and not according to the direction of the movement, that is to say, the particular muscles acted upon.

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* Lotze postulates such passive sensations as a factor in the local signs of the tactual surface.

† Thus it is known that the qualitative discrimination of impressions (*i.e.*, the sense of colour) becomes less fine as we pass from the centre to the periphery of the retina: a purple, for example, is seen as violet, then as blue.

‡ Wundt thinks we may judge of the distance of a point seen indirectly from the fixation-point more accurately by means of these qualitative differences of the retinal impression than of the sensations of touch. On the other hand we judge of relative direction by help of the tactual sensations. The same sensations tell us which of the two eyes is affected, and give us absolute direction and the erect position of objects.

The peripheral local sensations would of themselves give us the direction, but not the distance, of a point from the point of fixation. On the other hand the central feelings of innervation would supply us only with magnitude, and not with direction. The local signs form a continuum of two dimensions (answering to the vertical and horizontal directions). These dimensions, however, are heterogeneous since the local signs vary in a different way with every change in direction. The feelings of innervation, forming a continuum of one dimension, and measuring this heterogeneous continuum of the local signs in all directions, refer this continuum to a homogeneous continuum of two dimensions, that is to say, to a spacial surface.

The visual perception of space is thus regarded by Wundt as a product of the same mental process (synthesis of peripheral sensations and central feelings of innervation) as the tactual perception. What distinguishes the former from the latter is the reference of this complex of sensations to a single point, the retinal centre. This relation, which subserves the accurate measurement of the field of vision, and which first renders possible the functional combination of the two eyes in a double-eye, has its roots in the laws of ocular movement (those of Donders and Listing, No. IX. p. 5).

Since these laws have their foundation in an innate central mechanism, it must follow that the individual brings into the world with him a perfectly developed disposition to an immediate spacial arrangement of his sensations of light. At the same time it is probable that this innate mechanism itself has been slowly formed during the development of the species as an adaptation to the requirements of distinct vision with the double eye.*

In this way arises the monocular field having the retinal centre as its dominant position. The most general form of this field is the spherical surface lying about the centre of rotation of the eye. The distance of the point of fixation is of course limited by the state of accommodation of the moment.

A nearer determination of the field is effected in binocular vision in accordance with the law that both eyes continually possess a common point of fixation. At the same time the form of the field becomes more variable, since the common point of fixation may wander over surfaces of the most unlike form.* Accordingly the combination of the systems of local signs of both eyes with the feelings of innervation is a variable one.† As to what combination of local signs and what combined feeling of innervation actually ensue, this is commonly determined by the course of the lines of fixation (contours of objects) in the common field. That is to say, those points are co-ordinated which answer to the same object-points. At the same time through the normal conditions of vision, certain limits are set to this rule; and further, the local signs of those points which answer to the usual form of the field (*e.g.*, the plane of the ground) combine more easily than others. In this way Wundt seeks to interpret the phenomena of single vision and its limitations.‡

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* In this way Wundt would explain that peculiar adjustment of the forces of the ocular muscles rolling the eye upwards and downwards, to which he refers the single eye's error in the appreciation of the vertical, and which he thinks is due to the ancestral habit of moving the common point of fixation of the two eyes over receding lines in the plane of the ground (No. IX., p. 20, note).

Thus in the case of binocular vision we have to do with a more complicated synthesis than in the case of monocular vision. This may, for the sake of a clearer apprehension, be divided into two actions (which, however, are not to be thought of as actually distinct), a first through which, by means of the local signs and feeling of innervation of the first eye, the position of a given point *a* in relation to the point of fixation is determined, and a second through which then, on the addition of the second eye, the situation of the point of fixation as well as that of the point *a* in relation to the observer, is first determined.

Those directions in the field are preferred to all others, the perceptions of which by the eye in motion and at rest agree with one another. These are the lines of direction§ passing through the point of fixation, and which in narrow regions are straight lines. Only such small lengths are made use of in measuring out the field, and hence the straight line is for the eye the natural element of measurement. The nature of these lines of direction has its physiological ground in a peculiarity of our muscles, namely, that of turning their points of attachment

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* When there are no circumstances (contours, fixation-points) determining the double eye to select any particular surface, its field is to be regarded as a spherical surface, of which the point midway between the two centres of rotation is the centre.

† In general the local signs of points of equal height or depth are co-ordinated, whereas the lateral distances of points whose local signs combine may vary considerably. In every such variation the feeling of innervation of the double eye is different.

‡ Wundt sums up the facts under the following law: The excitation of such points as correspond to single object-points in the great majority of instances produces a simple perception more easily than that of other points. This covers the facts of identical (symmetrically lying) points, as also those of points which only combine under some special influence (contour in relief).

§ Equivalent to the 'great circles' mentioned in No. IX., p. 6, first note.

(Ansatzpunkte) round fixed axes. This property, then, must be regarded as the reason why visual space, just like tactual space, is a plane one; that is to say, since the straight line is the element, the constitution of the surface of the field of vision requires three dimensions.

Lastly, our visual perception depends on the influence of certain associations, which, owing to their later appearance, and also to their great variability, must be regarded as of a secondary kind. Such for example is the influence of the numerous incidents which make us interpret a drawing as a representation of solid objects lying at very unequal distances from us.

In looking over these various attempts to derive the visual form of space from elementary feelings, we are struck by the part allotted to ocular movement and its attendant feelings. The study of the laws of ocular movement, and of their bearing on our visual space-construction, must be regarded as an important addition to the English empirical doctrine.

This doctrine, starting from the Berkeleyan idea of visual language, has assumed somewhat hastily that the content of our visual perception is wholly extra-optical,* that is to say, consists of representations of tactual and motor experiences of the moving organs. There seems good reason to suppose that the feelings connected with ocular movement would of themselves (apart from limb-movement) serve to generate a kind of space-consciousness. The close analogy between the muscular actions of the eye and those of the tactual organs (brought out by Wundt) supports the view that each of these senses might independently attain a space-perception having certain properties in common.†

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* This does not apply to all English derivativists. Professor Bain, for example, distinctly recognises the co-operation of elements furnished by ocular movement.

† This recognition of ocular movement as an independent source of space-consciousness obviates many of the difficulties in the way of the Berkeleyan or derivative theory. Wundt's reasonings respecting the delicacy of the eye's motor discrimination (No. IX., pp. 8, 9) show that the superiority of the eye's perception, as compared with that of touch—a fact emphasised by Messrs. Abbott & Monck—is not incompatible with the theory which derives the essential content of space from motor experience. And even if it be true, as Professor Mahaffy contends (Kant's *Critical Philosophy*, Vol. I., Part I., pp. 118, 119), that the eye perceives forms on a small scale before it perceives them on a large scale (a proposition which seems very doubtful), Wundt's measurements provide a way of avoiding the conclusion that the first visual perception of form is retinal and not motor.

At the same time it is well to add that the derivative view does not depend on the accuracy of Wundt's reasoning. Even if, as Helmholtz seems to hold, the retinal discrimination surpasses the muscular, it does not follow from this that the retinal sensation furnishes any part of the material of our space-perception. It is quite open to the derivativist to say that the

What such an isolated visual space-consciousness would amount to, we can never expect to know, since it is vain to hope for cases answering to those of Cheselden and Franz, with the difference that the development of the visual organ precedes that of the organs of touch and movement.

We may, however, infer that at least such a visual perception would lack all sense of the third dimension or distance. One fails to see how the materials of feeling at the command of the eye could ever generate a consciousness of near and far. Wundt, who appears to regard the visual perception as complete, has by no means satisfactorily made out a case in favour of an independent presentation of distance. There is nothing in the feelings of accommodation to suggest distance, while the feelings of convergence are simply a mode of the same feelings which give us the two dimensions.* More than this, it seems probable that even the well-marked antithesis involved in our conception of superficial space, the vertical and the horizontal, would not emerge with any degree of distinctness in a purely visual space.†

With respect to the nature of the feelings attending movement, it will no doubt be for a long while a matter of dispute whether the feelings of innervation postulated by Wundt have any real existence.‡ On the other hand, it may be contended that Wundt ignores a part of the elements immediately given in the feelings of movement. It is not improbable that if there is a mode of consciousness attending the process of central (motor) innervation, this varies in character with the direction of the movement, that is to say, with the muscles innervated. And even if it were not so, it is to be supposed that the actual contraction of a particular muscle is attended somehow with a dis-

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essential *content* of the space-consciousness is extra-retinal (motor experience of the eye, the hand, &c.), that the local reference involved in our developed retinal sensibility rests on a process of association with this motor experience, and yet that this sensibility may supply a finer scale or measure than the motor sense itself. In other words, it is possible to conceive that, when once we have learned to interpret those local differences of retinal sensation which answer to distinctly felt motor differences, we may carry the process further, and give a motor significance to still finer retinal discriminations.

* I confess that Wundt's argument in support of a visual space of triple dimensions is by no means very clear.

† Wundt, so far as I understand him, says that this antithesis is given in the tactual sensations accompanying ocular movement. But this is by no means self-evident, unless we suppose the upper and the under regions of the orbit to be already adequately distinguished by help of extra-optical experiences. It seems to me that the antithesis might be more easily given by Lotze's feelings of movement than by Wundt's sensations of pressure.

‡ Their existence is called in question by Lotze, *Revue Philosophique* October, 1877, p. 359.

tinctive feeling, which would be the rough germ of the sense of direction.

This naturally leads us to remark on the theories of local signs just reviewed. The working out of this side of the derivative theory is of great value. That the eye at rest does perceive relative direction and distance is certain; and it remained for the derivativists to account for this local consciousness attaching to the various parts of the retina. It may be said, as English psychologists are wont to say, that the visual perception of a point in indirect vision as lying to the right or left of the centre of the field, and at a certain distance from the same, involves a reference to experiences of the motor organs. Yet it is all but certain (as I have observed) that this reference is mediate in character, and proceeds by way of a more direct representation of a sweep of the visual organ itself.

As to the exact nature of these local signs, there is no doubt ample room for different theories. It may be said, however, that Lotze's scheme seems preferable to that of Wundt, in that it finds the materials of the sense of direction in the feelings of movement and not in tactual sensations. Only one would be inclined to add that these representations of ocular movement are something more than signs, since they include a part of the space-intuition itself.*

We now pass to the further question, to which these observations naturally lead up, how we are to conceive the mental process by which the space-perception arises. This will depend in part on the content we give to the space-presentation. Thus Wundt, who appears to make this content altogether optical, naturally objects to such expressions as 'unconscious inference,' 'transition from sensation to associated idea.' Yet it is perhaps possible to present this very process of a reference to ocular movement as an operation analogous to an inference or a sequence of associated mental states. A perfect following out of the doctrine of the correlation of mind and body enables us to regard a process of association in its narrow sense, in which the mental elements are distinctly present, as but one case of a more general process, namely, the co-ordination of cerebral actions which, according to the degree of their connexion, and the rapidity of their sequence, have, as their mental correlatives, sometimes distinct feelings or ideas, sometimes an inseparable mass of feelings, and sometimes simply that mode of consciousness which belongs to the second and more enduring action. In this way one might conceive, for example, of the transition from some purely qualitative peculiarity of a retinal sensation (answering to the region stimulated) which was once an element of consciousness, but is now lost beneath the more important added element, namely, the representation of a definite kind of movement.*

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* Thus I find myself able to recognise, as a part of the content of the locality of a point at a given distance to the right of the centre of fixation, a certain kind and amount of ocular movement. To Lotze, of course, these local signs have in themselves no properly spacial character. This is seen plainly enough in the fact that the feelings of movement, in the case of the visual construction of space, have as their equivalents in the tactual construction certain passive sensations (attending the varying tensions of the skin, &c.), which sensations clearly do not involve a spacial or extensional consciousness. The 'feelings of movement' are to him *signs* which have first to be interpreted by the constructive mind. Helmholtz, who (as Stumpf remarks) does not define the sense he gives to the term 'local sign,' seems to lean to the idea that there are, antecedently to the growth of Lotze's 'signs' (feelings of movement), certain purely qualitative differences of sensation dependent on the retinal region stimulated. If this is his meaning, one could interpret the influence he assigns to ocular movement in developing local discrimination as the superposition of representations of movement on these unknown peculiarities. Yet his language is by no means clear on this point.

By the use of the term 'synthesis,' however, Wundt expresses more than a peculiarity in the mode of combination, namely, the heterogeneous character of the elements which compose the space-perception. His doctrine thus distinctly raises the question: Is space a product of any one kind of experience (motor)? —Are its characteristics given in any one mode of feeling; or does it arise from a combination and fusion of heterogeneous feelings? Each view has its difficulties. If, as our own psychologists appear to say,† the essence of space is motor experience, which touch-impressions only serve to define, the objection is urged, *e.g.*, by Wundt himself, that we cannot conceive any such motor experience except as already constituted by the idea of space.‡ On the other hand, the hypothesis of heterogeneous elements burdens us with the mystery of what may be called a psychical form of spontaneous generation.

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* These remarks meet Wundt's objection to the use of the term 'association'. It must be added that Wundt is not exact when he speaks of his synthesis as one of *sensations*. The only elements of sensation are the feelings of 'local colouring,' while those of touch (pressure) and innervation are representative or ideal.

† There is no doubt some uncertainty respecting this point. Even Professor Bain, who makes the muscular sense the great generator of our space-consciousness, seems to allow that tactual impressions, as elements of a series which can be indefinitely renewed in the forward and backward direction, and as coexistent feelings, give the finish, so to speak, to the perception of extension. Mr. Spencer lays most stress on this last factor.

‡ Not to speak of the yet more fundamental objection recently urged by Czolbe in his curious posthumous work, *Grundzüge einer extensionalen Erkenntnisstheorie* (p. 6), against any kind of pre-spacial experience. He says, that Helmholtz's theory, with its "inconceivable unspacialities" *(Unräumlichkeiten)* ought to be called transcendent rather than empiristic.

I am far from saying that either of these objections is fatal. It seems perfectly conceivable that there may be moments or aspects of the feelings accompanying movement which immediately yield a vague consciousness of spacial properties or relations. That we are unable to reproduce these elementary feelings and perceptions is no objection to this theory, since *ex hypothesi* they have long since been taken up into more complex mental products. On the other hand, it is at least possible (if it were not rendered highly probable by a number of facts) that the coalescence of a mass of feelings may give rise to a mode of consciousness very dissimilar to the elements. The difficulty of imagining such a chemical fusion is greatly reduced when some of the elements may be supposed to contain the rough germ of the resulting quality.*

It may be well to add that, as long as either of the rival suppositions can hold its ground, any hypothesis of a special space-constructing or locating activity, such as that vaguely hinted at by Lotze, and more distinctly put forward by Ueberhorst, must be regarded as premature. Such a hypothesis is clearly a departure from the stand-point of the derivative theory, and a step in the direction of the intuitional theory.

On the interesting question, how far the construction of visual space is aided by inherited dispositions, little needs to be said. Wundt's view of an innate motor mechanism, the result of a gradual ancestral adaptation, so far as it is proved by the facts (No. IX. p. 5), seems to be thoroughly credible. This idea is far from endowing the infant with an *a priori* form of space. It simply gives him a facility in reconstructing his extended world. It is noteworthy that a writer like Wundt, who in his last great work ever keeps the doctrine of organic evolution in view, is contented with assigning so modest a part to ancestral experience and inheritance in the individual's perception of space. He not improbably feels the difficulties besetting the hypothesis of a transmitted blank space-form.†

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* Wundt appears to overlook this altogether. He thinks an adequate explanation of space is found in the very fact of the coalescence (synthesis) of heterogeneous elements, and he expressly argues against Lotze that his local signs already carry the germ of space-consciousness. But is not this their chief merit?

† An extension of this mode of derivation, not more rash than that of Wundt's just spoken of, would be the reference of the reflex connexion between the stimulation of a given retinal point and the movement needed to shift the impression to the centre of the retina, to an ancestral habit, itself the result of a slow acquisition.

III. *Relation to the Kantian Problem.*

In concluding this brief review of the German theories of visual perception, it may be well to add one or two remarks on the relation of the question here in dispute to the philosophical problem of space as defined by Kant.

Although Kant gave the impulse to these physiological inquiries and speculations, it by no means follows that the problem with which the physiologists concern themselves is the Kantian. In truth we may rather expect the opposite, since questions of physiology and empirical psychology are quite distinct from properly philosophical questions. This remark has been insisted on with characteristic energy by W. Tobias, who resolutely combats the idea that the question of Nativism and Empirism is the Kantian problem at all. (*Grenzen der Philosophie*, chap. iv.) He says the point of dispute is "purely empirical," "purely one of natural science," namely one concerning an order of events in time (p. 110). Let us see how far this is correct.

There are two things to be distinguished here—the originality of the idea of space, and its subjectivity. Kant asserts the former, in so far as he says that no sensuous experience is possible without the form of space. Now the derivative theory distinctly maintains the existence of sensation prior to the construction of the space-idea. Even the modest assumption made by Lotze that sensations of colour are present in the infant mind before the local signs develop themselves—is to a certain extent a negation of the Kantian idea. The question, then, though undoubtedly one of events in time, as Tobias asserts, distinctly touches one part of the Kantian problem.

The essence of Kant's doctrine however relates to the question of the independent reality of space. Let us see whether the dispute just reviewed has any relation to this question.

We may here distinguish between two kinds of reality, phenomenal or relative, and noumenal or absolute. To these there correspond two questions: *(a)* How does visual space acquire that phenomenal reality which all agree in attributing to it? This question may be otherwise put: How do we come to see objects (phenomenal realities) in space? *(b)* The second question is: Does visual space answer to any noumenal reality wholly independent of the mind?

(a) It is clear that the peculiar doctrine of the Nativists provides no way of answering the first question. The mere fact of an original sensuous space contains no explanation of the objectivity (phenomenal reality) given to the intuition. On the other hand, the empiristic doctrine in one of its forms (as ap-

proximately represented by Helmholtz) does offer an explanation of this reality.* The reality of visual space to the modern English followers of Berkeley means the opposition of certain feelings (motor and tactual) to the present consciousness which merely represents these. Thus the reality of the space we see, and at the same time the externality in space of the objects we see, are accounted for in the very process of explaining the space-perception itself.

It remains, therefore, a question how the Nativists are to account for the reality of visual space, and at the same time for that correspondence between visual perception and tactual experience, which the Empirist is able to regard as involved in the very genesis of the former. In order to do this they must have resort to some properly metaphysical hypothesis. The reality and unity of space may be referred (as by Kant) to a single subjective form, which is applied alike to all varieties of sensation, and the application of which itself gives reality (objectivity) to impressions. Or they may be explained by saying that each of the senses immediately perceives one and the same noumenal reality.

(b) We are now prepared to see what the question between Nativism and Empirism has to do with the ontological problem respecting the independent reality of space. As I have just hinted, the Nativist may be just as easily a Realist as an Idealist (Kantian). In either case the originality of the visual perception, and its agreement in the case of vision and touch, would be equally well accounted for. On the other hand, the derivative theory, so far as it resolves the external space perceived in vision into a phenomenal reality (motor and tactual experience), may be said to discountenance the idea of a noumenal space by rendering it an unnecessary hypothesis. Yet, as I have remarked, the derivative view does not necessarily identify visual space with any definite mode of (represented) experience. Lotze, for example, says that visual space is something quite different from the feelings of movement which subserve its construction. Consequently the question still remains open whether the idea is purely a mental (subjective) creation, or answers to something independent of the mind. Thus just as it is possible for a Nativist to be a Realist, so it is possible for an Empirist to be a Kantian Idealist.

It may perhaps be objected that the derivative theory, by speaking of distinct sensory nerves and muscles—that is to say of objects having spacial relations—as the antecedents of our space-consciousness, does all the time assume the independent and absolute existence of that very space the origin of which it seeks in a certain mode of feeling. To this it is enough to reply, that workers like Helmholtz and Wundt occupy themselves solely with the empirical problem of accounting for the genesis of the space-perception in the individual mind, viewed as an objective process, that is to say, by another mind. To A, with his developed space-consciousness, the rise of B's space-consciousness presents itself as a sequence of definite feelings on definite material processes (nerve-stimulations) in space. B is able to view the genesis of A's space-consciousness in a similar way. Now it may be that the observer in each of these cases is, after all, conceiving under these material processes in space nothing but a mode of his own (or some third person's) feelings (motor and tactual). And thus it is clear that the genetic method, in connecting the perception with certain physical antecedents, makes no assumption respecting the independent existence of space.

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* Of course this does not apply to the theories of Wundt and Lotze, which regard visual space as different in kind from the experiences out of which it is constructed.

JAMES SULLY.

III.—NOTES ON THE PHILOSOPHY OF SPINOZA

In the spring of last year I had the honour of giving a Friday evening discourse on Spinoza at the Royal Institution which is printed very nearly as it was delivered in the *Proceedings of the Royal Institution* (Vol. VIII., p. 363). The wise custom which as a rule confines the length of such discourses to one hour imposed on me an amount of condensation which, however necessary for the spoken word, would be needless and unsuitable in a paper intended for the readers of MIND. The present article contains a more developed statement of points which, at the Royal Institution, I could merely indicate. In the course of my work on the subject I have received valuable communications from several friends, and I take this opportunity of acknowledging once for all in a general form obligations which it would be difficult to specify accurately or adequately in detail.

It may be taken as determined beyond question that in the *Ethics* of Spinoza we have one of the most remarkable achievements of constructive philosophic genius ever given to the world. In philosophy, however, as in literature and art, the power which stamps a man's work as eminently his own is to be sought not in the part but in the whole, and a true master's fame has nothing to fear from the utmost that critical research can do in tracing back to their sources the elements he wrought upon. As Prof. Land of Leyden well says (in his recently published lecture, *Ter Gedachtenis van Spinoza*, where much valuable matter, both historical and critical, may be found in a small compass), "originality consists, not in a man's producing every element of his work by himself, but in his binding together existing elements in a new combination which bears the stamp of his individuality, and leaves its mark behind it in the work of others". The steady light of great men's renown shines on long after the passing dazzle of so-called originality has disappeared. After all, what would a perfectly original idea be but an idea having no relation to the time, place, and circumstances in which it was put forth, and therefore hopelessly barren? True creation is not to make out of nothing, but to make new life out of the heritage of the past. In Spinoza's case there has been too much dazzle; the system of the *Ethics* seemed to have sprung from his brain armed at all points, and his conceptions, while they stood out in abrupt and isolated grandeur, have been more admired than appreciated. Leibnitz indeed asserted, and it has remained a sort of tradition in a certain school of philosophy to assert, that Spinoza did nothing but carry to an extreme development one side of the principles of Descartes. This position seems to me, I confess, so untenable that I can only wonder at its being still maintained by any competent person. M. Francisque Bouillier *(Hist. de la Philosophie Cartésienne)* adheres to it with very little qualification, and in particular minimises the importance of Spinoza's Jewish predecessors. It is fair to note that Dr. Joël's evidence was not before him. But Prof. Caird, with that evidence before him, has also taken the same line in his article on 'Cartesianism' in the *Encyclopædia Britannica*. I can account for it only by the exigencies of some pre-conceived or pre-adopted theory of what the history of philosophy ought to have been.

There is no doubt an unmistakeable Cartesian element in Spinoza, more especially in his form and method; and Descartes may also claim—what is more important than any particular doctrine—to have taught him that philosophy must thoroughly assimilate the lessons of natural science before she attempts any flight outside their range. The most striking specific points of Spinoza's philosophy remain, however, unaccounted for by Cartesian sources, or by any other sources that were open to him in common with the general world of letters. Only of late years the riddle has been solved, partly by the discovery of new materials for the history of Spinoza's own thought, but chiefly by the light thrown upon his already known works from an unexplored and, strange to say, unexpected quarter. It was for a long time assumed by historians of philosophy that, after he was cut off from the synagogue of Amsterdam, Spinoza had no further use for Jewish learning save for polemical purposes; and the assumption was the more convenient, inasmuch as that learning was outside the accustomed lines of western culture, and not easily accessible to any but Orientalists. It was reserved for scholars of Spinoza's own race to make good the share of the Jewish philosophers of the Middle Ages in the quarries whence the stones of his building were hewn. This work, begun by Auerbach, has been lately carried out by Dr. Joël of Breslau, who in a series of valuable monographs (now collected)* has given us a far juster notion than was before attainable of the resources Spinoza had at his disposal in the modern literature of his own people. I will now give a condensed account of the results of this line of inquiry, so far as known to me at present, collected from Dr. Joël's work and elsewhere. The simplest way is to take the leading names of mediæval Jewish philosophy in chronological order.

1. *Avicebron.*†

Ibn-Gebirol (d. at Malaga 1070) belongs to the earliest generation of Jewish philosophers, and is not the least striking figure among them. There is reason to think that some at least of his ideas found their way to Spinoza, but it was by a strangely circuitous road. In his day the Aristotelian doctrine, which so long held undisputed sway in both Jewish and Catholic schools, was still struggling with Neo-Platonism, and it was chiefly with Neo-Platonic materials that Ibn-Gebirol constructed his own brilliant and rather eccentric speculations. Honoured but little among his own people, he was soon overwhelmed in the Peripatetic flood, and entirely forgotten as a philosopher. Meanwhile his principal work had been translated into Latin under the name of *Fons Vitæ,* and became well known to the founders of the Scholastic philosophy. The author's name was concealed under the Latinised Avicebron, and by a sort of unreasoned mental attraction he was set down as belonging to the Arabian group headed by Averroes and Avicenna. It was only in late years that the sagacious industry of the late Dr. Munk re-discovered in the unknown Avicebron the Jew Ibn-

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* *Beiträge zur Geschichte der Philosophie,* Breslau, 1876. I cannot help finding one fault with Dr. Joël's work: he seems to assume that all his readers will be Hebrew scholars, and often gives long extracts without a translation.

† See Munk, *Mélanges de Philosophie juive et arabe;* Lewes, *History of Philosophy,* II. 61.

Gebirol. The *Fons Vitæ*, however, fell in due time into the hands of Giordano Bruno, who received it with a much more kindred spirit than Aristotelian orthodoxy had done. Bruno repeatedly cites Avicebron with approval, and there is a good deal of likeness in the general strain of their speculation. The ideas thus taken up were passed on in turn to Spinoza, who can never have even suspected how much nearer to him their real source was. Spinoza's relation to Giordano Bruno has been exaggerated in some quarters and ignored in others. It is enough to say, however, that there is no external probability against Spinoza having been acquainted with the main contents at least of Bruno's works, and the internal evidence in favour of it is all but irresistible. It may remain, perhaps, an open question whether Spinoza had read the actual text of Giordano Bruno, though there is no reason why his knowledge should not have been at first hand. There can also be little doubt that the terminology of Spinoza's metaphysic (as to attributes and modes) was suggested by Giordano Bruno. But of Spinoza's precision in the use of terms there is no trace in Bruno, who is everything but systematic.

The element specially contributed from this quarter to Spinoza's philosophy is that which has caused it to be commonly ranked as pantheism—the speculative delight in the conception of the world as an infinite unity, wherein all the varieties of finite existence are welded into one without losing their reality. Spinoza's philosophy is utterly remote from the Oriental pantheism which denies reality to finite things. People who talk of "Pantheism from the Vedas to Spinoza" for the purpose of showing that Spinoza produced only a new variety of ancient error show nothing but that they have either neglected to procure ordinary information, or are incompetent to discuss philosophy at all. It is needless to remark that the pantheism of developed Hindu philosophy is in fact later than the Vedas by a number of centuries not yet accurately determined. It is surprising, however, to find such a writer as Prof. Caird countenancing the vulgar error by speaking of "the Spinozistic pantheism that reduces the world and the finite spirit to an illusion". We shall shortly see that another Jewish predecessor may likewise claim a share in this element.

2. *The Jewish Peripatetics.*

Partly coinciding in time with Catholic Scholasticism, but with its rise and culminating period nearly a century earlier, a series of Jewish philosophers in Spain, Provence, and the East, did work which has a far more important place in the general history of philosophy than has commonly been allowed to it. The task they set themselves was the same in kind as that of the Schoolmen, who, in spite of religious difference, joined hands with them on the common ground of Aristotle, and used their work with open acknowledgment and respect. They strove, in one word, to systematise theology on an Aristotelian footing. For this purpose it was necessary to embark on a critical and philosophical interpretation of Scripture; and in this undertaking the comparatively undefined character of Jewish orthodoxy secured them a certain amount of freedom.* Or rather philosophy presented itself to Jewish speculation as an enlightened interpretation of the hidden meaning of the law. Thus Moses ben Maimon and Ibn Ezra were leaders in biblical criticism no less than in philosophy. The ideas they put forward in this field were to be carried out to their full development in the *Tractatus Theologico-Politicus.* Spinoza's object is indeed opposite to that of Maimonides; so far from finding philosophy in the Scriptures, he maintains that it is idle to seek it there; and the sharpness of his criticism on Maimonides's artificial system of interpretation has probably distracted attention from that which they really have in common. Maimonides' work was continued by Levi ben Gerson, or Gersonides (born at Bagnal in Provence in 1288, living in 1340), who, professing to be a mere interpreter of the Scriptures and to rely on them as the source of every kind of knowledge, was at the same time more thoroughly Aristotelian than his predecessors. The discovery of Aristotelian metaphysics in the Song of Solomon was probably the extreme feat of the Jewish theologico-philosophical dialectic.

The influence of these writers on the purely philosophical part of Spinoza's work was comparatively slight: it is perhaps not too much to say that there are only traces of it in the *Ethics.* Still the points of affinity are notable. The following are specimens of those which may be found in Maimonides' great work, the *More Nebuchim.*†

The will and the wisdom of God are regarded as inseparable. And not only is there no real distinction between the divine attributes, but no attribute whatever can be predicated of God in the ordinary sense—even eternity and existence, as applied to him, are merely *homonymous* with the same terms in any other application (c. 56 *et alit.*). This however is by no means peculiar to Maimonides.

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* The Mahometan schools enjoyed the same advantage. Strictly speaking, neither Judaism nor Islam has any dogmatic theology at all. At the same time there must have been in practice a good deal of restraint. Maimonides expressly warns his readers that on many points he will be deliberately obscure; and Ibn Ezra could only hint with elaborate mystery that "the Canaanite was then in the land" could not have been the language of Moses' generation. The intervals of absolute silence in his commentary on Isaiah are even more significant.

† Edited by Dr. Munk, *sub tit. Le Guide des Égarés*, with literal French translation.

The existence of God is involved in his essence ; otherwise of the existence of any finite creature, which may be considered as an accident in the logical sense (cc. 57, 58).

God coexists with the creation as its cause *in actu*, not as a cause *in potentia*, which precedes the effect in time.*

Perfect intellect forms no conception of good and evil, only of true and false. Such was the first state of Adam. Good and evil belong to the region of probable opinion (c. 2).

Dr. Joël also calls attention to Maimonides' reflections on final causes as being fitted to prepare the way for Spinoza's entire rejection of them.†

3. *Don Chasdai Creskas.*

Chasdai Creskas (of Barcelona, *fl. circ.* 1400) broke with the Peripatetic tradition to strike out an independent line of his own. Several of the most characteristic points of Spinoza's philosophy—some already well developed—are found in his *Or Adonai* (1410).

He censures as fallacious the notion of infinite extension being made up of measurable parts (Spinoza, *Eth.* i. 15, schol., *Ep.* 29): he also holds matter to be eternal, the act of creation consisting only in the ordering of it; and maintains that the material world, being (as known by revelation ?) good in its kind, partakes of the Divine nature. The contrast of this with the Cartesian theory of substances distinct *in genere* probably had something to do with Spinoza's conception of extension as an attribute co-equal with thought.

Again, the perfection of God consists not in knowledge, as the Aristotelians say, but in love. This love is what determines God to creation as a necessity of his nature, and nevertheless an act of will. Love being the chief attribute of God, the perfection of any creature depends on the extent to which it shares in this : thus the love of God (for its own sake, not as a means of salvation) is the chief end of man. Here we get some light on the fifth book of the *Ethics* of Spinoza, which has always seemed to me the most obscure part of his philosophy both in itself and in relation to the rest. Perhaps Orientalists may have yet more to tell us on this head.

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* Cap. 69. One may be allowed to note (though not here relevant) Maimonides' answer to the standing question why the world, if created in time, was created at one time rather than another. He says it is just like asking why there exists a certain number, neither more nor less, of individuals of any kind—*e.g.*, the fixed stars.

† *Zur Genesis der Lehre Spinoza's* (in *Beiträge zur Gesch. d. Philos.*)

Most remarkable of all, perhaps, is Chasdai's thorough determinism. He explicitly denies that any event, whether depending on human choice or not, can be called possible or contingent in an absolute sense. It is inconceivable, he says, "that two men, being themselves of like temper and character, and having before them like objects of choice in like circumstances, should choose differently". Volitions are determined by motives as much as anything else in nature is determined. An act of free will is *free* in so far as it is not *compelled*, but *necessary* in so far as it is not *uncaused*. Reward and punishment are themselves parts of the necessary order of things, attached however by Providence, for reasons of policy, to those actions which are free in the popular sense—that is, which are determined by a state of mind involving the love of God or its contrary. The argument on this topic seems to be fully worked out, and to deal with most of the points that have been made in later controversy on the subject. Chasdai holds fast, it must be remembered, to the idea of *designed* order in the universe, though final causes in the ordinary sense are as it were swallowed up in the absolute, self-sufficient necessity by which God's love manifests itself. Thus he cannot be regarded as a forerunner of Spinoza's system; Spinoza took the suggestions in detail and worked them into a systematic connexion of his own, which would probably have found little favour in Chasdai's eyes.

As to Descartes, Spinoza's philosophical relation to him has been so amply discussed that there is no occasion to dwell on it. I doubt, however, whether justice has been done to the scientific side of it. A clear grasp of physical conceptions and a careful avoidance of mistakes in physical science are prominent in Spinoza's work. That the spirit of exact science must go before the spirit of philosophy, if philosophy is to be more than a plaything, was a precept which Spinoza might learn from Descartes, and from him alone. I must add nevertheless that I do not agree with those (including Dr. Joël) who hold that Spinoza was at any time a Cartesian. All the evidence we have goes to show that such a time, if any, must have been exceedingly short. The early *Essay on God and Man* is little, if at all, more Cartesian than the *Ethics* in its general principles, though doubtless much more Cartesian in detail. The account of the passions follows pretty closely Descartes' *Traité des Passions:* yet the differences are already important. Of Descartes' elaborate physiological explanations there is not a word, an omission which we may fairly interpret by the light of Spinoza's later criticism. Descartes asserts that all the passions are in themselves good, and only their excess is harmful; sorrow has its place no less than joy, and is even "en quelque façon première et plus nécessaire". Spinoza denies it even more sharply than in the *Ethics*, rejecting hope, fear, and all passions derived from them, as unworthy of a wise man's life.

As to the *Principles of Cartesian Philosophy*, I can see no sufficient reason for doubting Spinoza's own account of the circumstances under which that work was produced. He was unquestionably not a Cartesian when it was put into shape for publication; and if we may trust his own words, he was not so at the time of giving the private lessons that were the foundation of it (*Ep*. 9). In short, at the most important time of his growth Spinoza necessarily breathed a Cartesian atmosphere, just as a century and a half later he would have breathed a Kantian atmosphere: but it is a long way from this to making out a case of subordination or even of direct descent.

When everything has been said about the sources of Spinoza's philosophy, or rather of the several elements combined in it, the whole remains as much his own as ever. Nothing more strongly shows its individuality than the extreme difficulty of making it fit into any of the usual classifications. It has been called by every possible name, but the more one considers it, the more it refuses to be put into any of the pigeon-holes labelled with words in *ism*. Every name is found to halt somewhere in the application except those which are too vague to convey any real information. There is no pleasure and small profit in discussing the various attempts of critics to mete Spinoza with their various little measures. It is simpler to give the reader an earnest warning once for all not to take upon trust any statement, especially any hostile statement, of Spinoza's doctrines. The use of good expositions is to send one to the text; and this is eminently the case with Spinoza. I know of hardly any philosopher since Plato who loses so much in being reported at second-hand.*

The reader of the *Ethics* is startled almost at the threshold—

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* The best general account is Kuno Fischer's. Of distinctly adverse critiques the best I know is Saisset's; for M. Paul Janet's excellent papers on Spinozism can hardly be classed under that head, though his philosophy is widely different from Spinoza's. One or two which have lately appeared in sectarian journals in this country are beneath serious notice. John Howe's *Living Temple* (1702) deserves remark as containing the first English polemic against Spinoza. The argument never gets beyond the definitions of substance and attribute. Howe shows no sign of really understanding Spinoza, and I suspect that he had not read more than the first Part of the *Ethics*.

many I believe are deterred—by the theory of the Attributes. This, if it is nothing else, is one of the most brilliant *tours de force* ever achieved in metaphysics. Looking at the matter in a purely scientific spirit, I suppose we must not approve *tours de force* on any terms. Yet it is impossible to refrain from admiring a flight of speculation which is guided in the very height of its daring by the finest possible sense of the dangers to be escaped on either hand. In the light of more recent controversies one is almost tempted to call it a prophetic tact. Those who maintain that the methods of scientific inquiry, if good for anything, are good for the whole field of human knowledge, have ever been assailed by the cuckoo cry of materialism. They are charged (in almost every case most unjustly) with seeking to reduce all being to that which can be touched and tasted and handled. Spinoza soars at one stroke to a height where this cackling is inaudible. The material world, or to speak with Spinoza, the world perceived under the attribute of extension, is complete in itself; the laws of matter and motion are our sole and sufficient guides to the understanding of it. But this is not the whole world. Extension is only co-ordinate with thought and with infinite other aspects under which existence may present itself to other intelligences than ours. Extension is not after the other attributes, but it is not before them. The universe in its conceivable though not imaginable fullness is infinitely beyond any sensible world. Whatever else Spinoza's system may be, it is not materialism or naturalism. We know, again, how many flying from the Charybdis of materialism have been wrecked on the Scylla of idealism. They have sought to bring the unruly world of things into subjection by making it out a mere creature of thought. They have turned the realities of common life into a phantom show deceiving the self that brought them forth. But a sure Nemesis awaits all such attempts to spurn the conditions of existence: the self thus made the measure of all things has at last no assurance of its own reality. The cure prescribed for materialism turns out to be the heroic remedy of absolute scepticism, and from this worst fate of all a fresh escape has to be sought in some violent assumption. A very few bold and honest speculators, such as Fichte, make their assumption openly, but as a rule it is more or less elaborately disguised. Spinoza saw the net spread for the tribe of modern idealists, and he would have nothing to do with a phantom universe. Extension is as real as thought, or rather they are one and the same reality. I am real in exactly the same sense that the world I live in is real, and we are each other's sureties, if the expression may be allowed, that the whole thing is not one vast illusion. It is needless to say however that this language is not Spinoza's;

the questions it suggests are nowhere explicitly discussed by him. For my own part I do not think any theory of perception can be satisfactory which treats man as a mere individual. I believe that a human being's assurance of the reality of things outside him is inseparably connected with his assurance of the reality of other people, and I half suspect that the latter really comes first. Some social feelings are probably inherited, and social feelings involve the belief that your fellow is as real as yourself. But to dwell on this would take us much too far from Spinoza.

The question remains, and is a fair one, whether Spinoza's metaphysic, though it steers clear of subjective idealism as well as of materialism, is not in some sense idealist after all. The infinite attributes—which are of no practical use, as our knowledge is limited to those of extension and thought—seem at first sight designed to avoid such a result. The ideal or psychical order of the universe is merely one of infinite orders, all strictly homologous with one another and with the ideal order, while differing in kind. So in plane geometry we may conceive figures similar and similarly situated to those we are dealing with to be repeated in an infinite number of planes other than the plane of the paper. But the descent from this conception to our finite experience is not made out. I do not mean only that no reason is given why finite things should exist at all, why there should be variety among them, why they should be as they are and not otherwise, and the like. That class of questions may well be put aside, and Spinoza did expressly put them aside, as being irrational *(Ep.* 72*)*, and accordingly divers ingenious persons have first assumed that Spinoza meant to answer such questions, and have then proved, much to their own satisfaction, that he did not succeed in answering them. But the relation of thought to the other attributes remains obscure. Man is an extended and thinking being, and nothing else. How does Spinoza account for his being nothing else? What becomes of the infinite modes of other attributes corresponding to the mode of extension which is the human body? Spinoza seems to say that each of these has a finite mind to itself: and that besides all these there is an idea or mode of thought* not in any finite mind *(in infinito Dei intellectu)* which in some way more eminently corresponds with all the homologous modes of the other attributes.† This leads us into regions where articulate speech becomes impossible, and we can only manipulate symbols of imaginary quantities. Meanwhile the definition of Attribute is itself idealist in its language: "Per attributum intelligo *id quod intellectus de substantia percipit* tanquam eiusdem essentiam constituens". This seems to cut the ground from under the equality of the Attributes; and if they are not equal, their infinity will hardly serve its purpose. Now the insoluble puzzles we have just glanced at arise wholly from the infinity of the attributes — in other words from the attempt to make the world of experience carry the burden of worlds beyond experience. The real working parts of Spinoza's system, which are naturally concerned only with the world we do know, remain substantially unimpaired when these brilliant but dangerous ornaments are given up. The conception of Substance and Attribute taken not merely from the definitions, but as we find it worked out in the second and third parts of the *Ethics*, leads to such a view of the relations of mind and matter as is now called Monism; and herein Spinoza's position is at least compatible with an idealist Monism such as my friend Professor Clifford has lately advocated. Some such conclusion, I believe, is that to which philosophy and science are now converging. The dualism of matter and mind is becoming not only inadequate but unthinkable. Mr. Lewes, Mr. Spencer, Professor Huxley—yea, the new Oxford school of Hegelians, though in a speech hard to understand—are all telling us the same story in their different ways. The greater part of what is denounced as "scientific materialism" is only very good Monism. If any one expects to build up a soul out of soulless atoms, it is not Prof. Tyndall or Prof. Huxley. The life-potent atom of the Belfast address is not a piece of the old material substance of the schools. It is rather a monad instinct with its share, however lowly, of mind, soul, spirit, or whatsoever name may be given to that very certain reality which finds its highest known manifestation in the consciousness of civilised man. We can now less than ever admit a break in nature in either the material or the mental aspect of life: neither can we stop even at the old break between the organised and the unorganised world. It will one day be understood that Mr. Darwin has made materialism impossible. The people who still cry *materialism* may perhaps not find scientific idealism much more to their taste: but that is another matter.

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* *Idea* in *Spinoza's* usage=mode of the Attribute *cogitatio*, not necessarily in a human or conscious mind. It would include Prof. Clifford's "elementary feeling" or "piece of mind-stuff".

† Correspondence between Tschirnhausen and Spinoza (*Ep.* 67, 68). Spinoza's answer is only a fragment, and I must confess that after repeated

Let us turn to Spinoza, and we shall find that the very keystone of his psychology is this principle of con-

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consideration I do not fully understand it. I doubt whether Spinoza was quite satisfied with it himself. See *Ep.* 72.

tinuity, apprehended with a firmness of mental grasp, and carried out to its results with a thoroughness and clearness which have been surpassed by no modern writer. The distinction between mental and material phenomena, which forces itself upon man as soon as he begins to think at all, leads him to conceive of mind and matter—the regions of inner and outer experience—as two distinct worlds set over against one another and separated by a great gulf. The philosophers of all ages have busied themselves with attempts to bridge this gulf, which have all failed. We are delivered from floundering in pathless contradictions, and consequent invocations of some *deus ex machina*, only when we perceive that the gulf itself is the creature of our own thought. The question put in the dualist form—How does Mind act upon Matter ?—is irrational and insoluble. The Cartesians and afterwards Leibnitz, perceiving this but clinging to the notion of mind and matter as distinct entities, were led to the devices of Occasional Causes and Pre-established Harmony.* Spinoza, for his part, rejects the two entities. The distinction between the physical and the mental order of phenomena is made sharper than ever : no link in the one series can be a link in the other, so that to speak of will, for instance, as possibly a form of energy is to put words together without meaning : but this is just because the two series are the diverse expressions of one and the same reality. If the rough comparison of the clock may pass muster at all, we must speak not of two clocks, but of one clock with two faces.† It will be observed that Spinoza does not assume an unknowable reality behind the manifestations. I think he would have said, agreeing herein with Berkeley, Ferrier, and idealists generally, that unknowable reality (that is, unknowable absolutely, not merely to us) is a contradiction in terms. Now I am far from saying that Monism, in Spinoza's or any other form, is demonstrated. It seems very doubtful whether any proposition about the relations of mind and matter is capable of demonstration. We may be satisfied if we get a conception which is consistent in itself, involves the least possible amount of assumption about the ultimate nature of things, and above all conforms to the scientific postulate of continuity. Prof. Tyndall has observed (*Fortn. Rev.*, Nov. 1877, p. 607): "It is no explanation to say that the objective and subjective effects are two sides of one and the same phenomenon". If I may say so without presumption, I entirely agree. It is not an explanation, but a statement which puts us on our guard against fallacious shows of explanation and helps us to see that no real explanation is possible, or that the further question (to take it in Prof. Tyndall's form): "Why should the phenomenon have two sides?" is in its nature unanswerable. The point of the monistic hypothesis, it must be repeated, is that the two-sidedness does not emerge abruptly in the consciousness of vertebrate animals or at any other point in the scale of organic nature, but runs through all phenomena whatever. The water that "runs into frost-ferns upon a window-pane" certainly does not think. It is fairly certain that it does not in the popular sense feel. But that it does not in some sense feel appears to me a very rash assertion indeed, and savouring of a dogged and desperate materialism. And it is of no possible scientific use. The monistic conception may at least serve to keep the provinces of physics and metaphysics distinct, and (if I may repeat an expression I have used elsewhere) to save metaphysics from degenerating into bad physics. And it has a real practical value in teaching us what to expect and what not to expect from physiology. It shows us the importance of observing vital phenomena from the physical side, while it guards us against materialism. This did not escape Spinoza, who says—after asserting the exact correspondence of body and mind, as representing a substantial identity* — "Hence we understand, not only that the mind of man is united to the body, but what is to be understood by this union: yet the same cannot be understood adequately or distinctly without first having an adequate knowledge of the nature of our body:" and he goes on to state, briefly but unmistakeably, that everything has a share of life, and that the degree of life depends on—or rather *is*—the degree of organisation.† The power of the psychological method thus obtained is shown by the ease with which, a few propositions later, Spinoza anticipates the modern doctrine of Association, and that on its physiological side.‡

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* The doctrine of occasional causes is not in Descartes himself : he seems to have formed no distinct theory. Leibnitz's simile of the two clocks is also found in Cartesian writings. See the quotation from the editor of Geulincx's posthumous *Ethics* in Bouillier's *Hist. de la Philos. Cartésienne*, I. 305 (3d ed).

† For the fuller setting forth of all this see Mr. G. H. Lewes's last volume of *Problems of Life and Mind*. Compare also Dr. S. E. Löwenhardt's *Benedictus von Spinoza in seinem Verhältniss zur Philosophie und Naturforschung der neueren Zeit*, Berlin, 1872—where the harmony of Spinoza's doctrines, especially on this point, with modern science, is discussed with much vigour and ability.

Even more remarkable is the theory of Desire in the third part of the *Ethics*, and the treatment of the Passions founded upon it. For the scientific worth of Spinoza's results it is enough to quote the testimony of Johannes Müller:—"With regard to the relations of the passions to one another, apart from their physiological conditions, it is impossible to give any better account than that which Spinoza has laid down with unsurpassed mastery. In the following statement I shall therefore confine myself to giving the propositions of Spinoza on that subject."* And this he does accordingly, without further criticism or comment.

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* Mind and body are "*unum et idem individuum, quod jam sub cogitationis, jam sub extensionis attributo concipitur*". *Eth.* ii. 21, schol.

† *Eth.* ii. 13, schol.

‡ Propp. 17, 18.

Spinoza reduces the passions to the elements of pleasure, pain, and desire. Pleasure is defined as the passage from less to greater, pain as the passage from greater to less perfection. This is singularly like the account of pleasure and pain lately given by Mr. H. Spencer on biological grounds—namely, that pleasure is originally correlated to actions beneficial to the organism, pain to those which are injurious to it. Desire does not mean for Spinoza a desire of pleasant things as such. All living things, whether conscious or not, have *appetite*—a physical impulse determined by the universal tendency or *effort*, as Spinoza calls it, towards self-preservation. Desire is conscious appetite, and as such is prior to the voluntary pursuit of pleasant things as pleasant. Pleasure and desire are related not as cause and effect, but as effects of a common set of causes or functions of the same conditions. This appears to me truer, deeper, and more fruitful, than the current modern notion that desire consists in the conscious pursuit of something already deemed to be pleasant. Spinoza's conception is also far more consonant with what science has now taught us to think of the history of life on the earth. The self-preserving effort of all things—"conatus quo unaquæque res in suo esse perseverare conatur"—does not seem, as it stands in the *Ethics*, to be sufficiently connected with the living world. There is a gap left open between the idea and the facts. But the wonder is that Spinoza left it open exactly at the right place. He could not have filled it in adequately with the materials he had, and he had the wisdom to let it wait. The theory of Evolution has now supplied the moving force that was wanting. The impulse, older by countless ages than conscious desire, older even than anything to which we grant the name of life—

> "The will to live, the competence to be,"

this is now in the sight of all men, even as it was for Spinoza's keener vision, the root of all action and of all that makes the world alive. If Spinoza had not the advantages of modern supporters of evolution, he was free from some of their temptations. He never hypostatises the universal *conatus*, as some have done in our own day, into a sort of unconscious Providence, nor does he fall into a confused nature-worship. Still less does he discover in all the workings of the world the vast plot of a blindly-cunning power to deceive every creature into keeping up the supreme evil of life. For him the universe and the natural order of things are in themselves neither good nor bad, those terms having no meaning except in relation to the welfare of some individual or kind.

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* Müller, *Physiol. des Menschen*, vol. ii., p. 543.

True to the principle of continuity, Spinoza does not hesitate to carry this same conception into the field of moral action. Here as elsewhere the self-preserving *conatus* is the ultimate fact of life. "The foundation of virtue is no other than the effort to maintain one's own being, and man's happiness consists in the power of so doing."* But this does not lead—as might be supposed, and is now and then supposed by persons who have not read Spinoza to the end—to a system of selfishness or even of rational egoism. For Spinoza treats morality from a completely social point of view, as the business not of the individual simply, but of the individual living in a society in whose welfare he must find his own. He does not stop to prove that it is for the interest of the individual to promote the common weal; he simply appeals, in effect though not in express terms, to the fact of experience that man is a social animal. "Homini nihil homine utilius." In this frank assumption of the essentially social character of morality he is at one with the Stoics.

Throughout his ethical doctrine, indeed, the parallel with the Stoics is of the most striking kind. The Stoic principle of "following nature" as explained by the Stoics themselves, is really identical with Spinoza's "suum esse conservare". In both systems we start from the position that as a matter of fact man's nature is social: and then the application of the general principle to man as a social animal leads to the conception of morality and virtue as aiming at the welfare of the community before that of the individual. The reasonable man ("qui ex ductu rationis vivit," and, by a still more singular coincidence with Stoic speech, "homo liber") must seek his own weal in the common weal. In both systems again, all men, good and bad, fulfil in some way the universal and necessary order, being themselves part of it; but the righteous man fulfils it with willing consciousness, thus doing a service which is perfect freedom, and therein finds his sure and sufficient reward. Can all this be coincidence? At first sight it is hard to think so; but on the whole I do so think, for the very reason that the resemblances go so deep down. They are not of the kind that would result from a second-hand acquaintance with Stoicism, such as might be got, for instance, through Cicero. If it were so, one would find Stoic forms and phrases, or at least reminiscences of them. But Spinoza's language is all his own. And an acquaintance at first hand is very unlikely. Of Plato or Aristotle, at least, Spinoza must have known very little to speak of them as he does, putting them aside as mere fathers of scholastic figments, not to be listened to by reasonable people *(Ep.* 60, *ad fin.)*. And there is no reason to suppose that he thought later Greek philosophy more worthy of attention. We have, moreover, his own statement that his knowledge of Greek was imperfect.

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* *Eth.* iv. 18 schol.

In his estimate of the extent to which the conditions of happiness are under man's control, Spinoza goes a good way with the Stoics, and with them also he qualifies the practical effect of this estimate by saying that the life of wisdom, though possible, is so hard that very few find it. There is, however, nothing to correspond to the famous paradoxes. These were simply unflinching deductions from the teleological optimism which was a fundamental principle of the Stoic system but has no part in Spinoza's. Epictetus would preach to a man with a toothache that toothache is not really an evil, but is to be accepted as a necessary part of an order which is absolutely good. Spinoza would say that the facts constituting a toothache are, in themselves, as part of the order of nature, neither good nor bad; but he would not dispute that they are bad for the organism in which they happen. Still the Stoics had got the root of the matter in seeing that it was absurd to complain of the universe for giving one a toothache. Man has no rights against the universe—and owes it no duties. It may be objected that Stoicism even with nature-worship is hard enough, but Stoicism without nature-worship would be intolerable. This however is to mix up philosophy and poetry. No doubt it is undesirable to think and speak scientifically at all times, just as society would become impossible if every man always stood on his strict rights. The popular and poetic language which admires, exalts, or even adores the order of nature is fit and laudable in its place. But the prosaic reason of the facts behind it is that, being born into an order of things we did not make and cannot unmake, we have to conform to it at our peril; which being so, the only rational thing to do (as M. Renan somewhere says) is to make the best of the necessity and be wise with a good grace. And on this ground there is no fear that the poets and prophets will ever cease to be welcome.

It is not in the cosmical but in the social order that we must look for the full harmony of reason and feeling, the reconciliation of science and poetry. In the common weal of our fellow-men, and in that alone, can we find a true and sufficient law of life, proposing an unlimited field of labour for the reason, and an unlimited scope for the best affections of our nature. Impelled by the sympathies laid up within us by the thoughts and deeds of the past, and guided by the ever ripening wisdom delivered from generation to generation, it is for man to seek his inheritance in fulfilling that law, and therewith to be content. If any think they are assured of something more, we grudge them not their hopes. But let them not force their promises upon us, nor forbid men to love one another without first loving some inscrutable ideal. Let them not disparage the plain grounds and sanctions of human morality to exalt the virtues of their supernatural remedies for our ills. Righteousness and goodwill among men are too precious to be the monopoly of any sect or persuasion; they will not be tied down to an assent, real or nominal, to speculative propositions. Speculation is doubtful and divided; experience, continuous, certain and fruitful. Morality, being founded on experience, can be in no real danger from speculation. To cry down speculation in the interest of morality is the act, if sincere, of a shallow and fickle mind to which the foundations of morals are but casual and arbitrary ordinances. If insincere, I know of only one name by which honest men may call it.

FREDERICK POLLOCK.

NOTE.—A very brief indication of modern authorities on Spinoza (besides those already cited in the course of the foregoing paper) may perhaps be useful.

The biography prefixed to the last edition of Auerbach's translation of Spinoza's works (Stuttgart, 1871), together with the preface, contains either explicitly or by reference almost everything necessary to be known. The translation itself is scrupulously exact, and may be consulted with great advantage. The version of the recently discovered works is by Professor Schaarschmidt, of Bonn, and as to the *Tractatulus de Deo et Homine* probably represents a better recension of the original text than has yet been published.

Dr. A. Van der Linde's *Benedictus Spinoza : Bibliografie* (The Hague, 1871) gives a classified catalogue, as exhaustive as human industry can make it, of everything published of and concerning Spinoza down to the date. (The same author's earlier book on Spinoza, Göttingen 1862, contains the curious and formerly little known history of the Spinozistic heresies which sprang up in the Reformed Church of Holland in the 18th century.)

The second edition of Dr. J. van Vloten's book (*Baruch d'Espinoza zijn leven en schriften* ; in 2d ed. the title is changed to *Benedictus de Sp. naar leven en werken*) appeared in the same year. There is unfortunately no translation of it. It is the best if not the only comprehensive account of Spinoza's life and philosophy yet produced in a literary and untechnical form. Dr. Van Vloten's chief weakness, in my opinion, is one which he has in common with Dr. Löwenhardt, whose book has already been mentioned. He tries now and then to be more Spinozist than Spinoza himself, or rather to make Spinoza so.

Dr. Hugo Ginsberg has brought out a new edition of the *Ethics* and *Letters* with useful prolegomena (Leipzig, 1875-6 : see Mr. A. B. Lee's notice in MIND, No. VI., p. 273).

A recent and very full monograph on the philosophy is Theodor Camerer's *Die Lehre Spinoza's*, Stuttgart, 1877. I have been able as yet to make only a slight examination of this. The criticism is minute and ingenious ; so minute that a reader not already familiar with Spinoza would be in some danger of not seeing the wood for the trees, and so ingenious as rather to exceed the bounds of profitable discussion. Herr Camerer seems to have a predilection for difficulties, and to choose the more involved and troublesome view of Spinoza's meaning wherever there is any choice. In at least one place (*Eth.* ii. prop. 21) he forces upon Spinoza, in my opinion, a difficulty which Spinoza was especially careful to avoid. As to the general interpretation of the system he seems to stand at the opposite extreme to Dr. Van Vloten.

The bicentenary commemoration at the Hague has given rise to a good deal of occasional and controversial literature, much of it bearing only remotely on Spinoza and his doctrines. One ultramontane journal devoted several articles to violent abuse not only of M. Renan—to whom it denied even the merit of a commonplace sophist—but of his style, which it discovered, much to its own satisfaction, to be "flasque et énervé". Dr. H. J. Betz's little book (*Levensschets van Baruch de Spinoza, met een kort overzicht van zijn stelsel,*" The Hague, 1876) may be mentioned as of permanent value.

IV.—THE ORIGIN AND MEANING OF GEOMETRICAL AXIOMS. (II.)

MY article on 'The Origin and Meaning of Geometrical Axioms' in MIND No. III. was critically examined by Professor Land in No. V., and I will now try to answer his objections. We differ substantially on two points. I am of opinion that the recent mathematical investigations—or, as they have been called, "metamathematical investigations"*—as to wider kinds of geometry, have established the following propositions :—

(1) Kant's proof of the *a priori* origin of geometrical axioms, based on the assumption that no other space-relations can be mentally represented, is insufficient, the assumption being at variance with fact.

(2) If, in spite of the defective proof, it is still assumed hypothetically that the axioms are really given *a priori* as laws of our space-intuitions, two kinds of equivalence of space-magnitudes must be distinguished : *(a) Subjective equality* given by the hypothetical transcendental intuition ; *(b) Objective equiva-*

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* The name has been given by opponents in irony, as suggesting "metaphysic" ; but as the founders of "Non-Euclidian Geometry" have never maintained its objective truth, they can very well accept the name.

lence of the real substrata of space-relations, proved by the equality of physical states or actions, existing or going on in what appear to us as congruent parts of space. The coincidence of the second with the first could be proved only by experience; and as the second would alone concern us in our scientific or practical dealings with the objective world, the first, in case of discrepancy, must be discounted as a *false show.*

For the rest, it is a misunderstanding on Prof. Land's part if he thinks I wished to raise any objection to the notion of space as being for us an *a priori* and necessary, or (in Kant's sense) transcendental, form of intuition. I had no such intention. It is true, my view of the relations between this transcendental form and reality, as I shall set it forth in the third section of this paper, does not quite coincide with that of many followers of Kant and Schopenhauer. But space may very well be a form of intuition in the Kantian sense, and yet not necessarily involve the axioms. To cite a parallel instance, it undoubtedly lies in the organisation of our optical apparatus that everything we see can be seen only as a spacial distribution of colours. This is the innate form of our visual perceptions. But it is not in the least thereby predetermined how the colours we see shall co-exist in space and follow each other in time. And just so, in my view, the representation of all external objects in space-relations may be the only possible form in which we can represent the simultaneous existence of a number of discrete objects, though there is no necessity that a particular space-perception should co-exist with or follow upon certain others; *e.g.*, that every rectilineal equilateral triangle should have angles of 60°, whatever the length of the sides. By Kant, indeed, the proof that space is an *a priori* form is based essentially on the position that the axioms are synthetic propositions *a priori.* But even if this assertion with the dependent inference is dropt, the space-representation might still be the necessary *a priori* form in which every co-extended manifold is perceived. This is not surrendering any essential feature of the Kantian system. On the contrary, the system becomes more consistent and intelligible, if the proof of the possibility of metaphysic derived from the evidence of geometrical axioms is seen to break down. Kant himself, as is well known, limited the scope of metaphysical science to the geometrical and physical axioms. But the physical axioms are either of doubtful validity, or they are mere consequences of the principle of causality, that is to say, of our intellectual impulse to view everything that happens as conforming to law and thus as conceivable. And as Kant's *Kritik* is otherwise hostile to all metaphysical reasoning, his system seems to be freed from inconsistency, and a clearer notion of the nature of intuition is obtained, if the *a priori* origin of the axioms is abandoned, and geometry is regarded as the first and most perfect of the natural sciences.

I pass accordingly to the proof of the two theses enunciated above.

I.

Kant's proof of the *a priori* origin of the geometrical axioms is based on the assertion that it is impossible to form a mental representation of space-relations at variance with Euclid's geometry. But the "metamathematical" investigations passed under review in my former paper have shown that it is quite possible to devise and consistently work out systems of geometry that differ from Euclid's both in the number of space-dimensions and in their axioms, with their related systems of mechanics. I myself have tried to show what would be the sensible appearance of objects in spherical or in pseudospherical space. The mathematical correctness of those geometrical deductions (carried out for the most part analytically) is, as far as I can see, beyond question, and the like may be said as to the perfect validity of the corresponding systems of mechanics, which afford the same degree of free mobility for solid bodies, and the same independence of mechanical and physical processes on mere position, that are presupposed in the Euclidian geometry. Nor is there the least difficulty or uncertainty as to the nature of the space-perceptions that human beings would have in such other circumstances. In particular, Beltrami's discovery of the way of representing pseudospherical space in a sphere of Euclidian space shows directly what would be the appearance of optical images in pseudospherical or spherical space. Every optical image of objects at rest as seen by a spectator at rest would, in fact, be exactly the same as that of the corresponding representation in Beltrami's sphere as seen from the centre (supposing always that the distance of the two eyes may be neglected in comparison with the imaginary radius-of-curvature of the space). There would be a difference only in the order of succession of the images, according as the observer or the solid objects moved. Nothing would be changed but the rule for inferring what images would succeed others in case of movement. And, as I have maintained, such differences are not necessarily considerable, nor need they excite attention. Men lived for a long time on what they thought was the flat earth, before they discovered its spherical form, and they struggled long enough against this truth, just as our Kantians at the present day will not listen to the possibility of representing pseudospherical space. The discrepancies in pseudospherical space would be of a somewhat similar kind, and not necessarily more striking (if the measure-of-curvature tallied) than are those betrayed by the spherical surface of the earth to an observer whose movements are limited to a few miles.

In discussing the question whether space-relations can be imagined in metamathematical spaces, the first thing to settle is the rule by which we shall judge of the imaginability of an object that we have never actually seen.

I advanced a definition which was to the effect—that for this we need the power of fully representing the sense-impressions which the object would excite in us according to the known laws of our sense-organs under all conceivable conditions of observation, and by which it would be distinguished from other similar objects. I am of opinion that this definition contains stricter and more definite requirements for the possibility of imagination than any previous one, and, as far as I can see, Prof. Land does not contend that these requirements cannot be satisfied for objects in spherical or pseudospherical spaces. At the same time, the representation of objects that we have often perceived, or that resemble such in whole or in parts, will necessarily be superior in one respect to the representation of objects of which this cannot be said, namely, in the swiftness and ease with which we can imagine beforehand the various aspects of the objects under different conditions of observation, or run them over in memory. This ease and swiftness in the imagination of an object never actually seen, will be wanting just in proportion as the observer has more rarely perceived and less carefully apprehended anything like it. Now we have absolutely never had before us constructions of three dimensions in spherical or pseudospherical space. The geometer, however, who has trained himself in the power of representing surfaces that can be bent without stretching and without change of their measure-of-curvature, as also the figures that can be drawn upon them, finds relations in these that are closely analogous to the relations in those other spaces. The physiologist too who has studied the combinations of sense-impressions under every possible variety of conditions, such as never occur in daily experience, is more practised in representing unusual (but yet strictly determinate) series of sense-impressions than one who has never had the same training. I may perhaps be pardoned, then, if I do not see why the fact that I come "fresh from the physiology of the senses" to epistemological inquiries should be a positive bar to my dealing with such questions as the one before us.

Since, then, the metamathematical space-relations have never been actually perceived by us, we are not to expect to have that power of swift and easy representation of the varying aspects of objects in them that can come only from daily experience and practice. The utmost we can expect is to arrive by slow steps and careful reflection at a full and consistent representation of the corresponding series of sense-impressions. But in point of fact, we strike upon as great and similar difficulties of representation when we seek to figure to ourselves the course of a greatly knotted thread, or a many-sided crystal model, or a complex building that we have never seen, although the possibility of figuring all these is proved by the fact of actual perception.

Unfortunately, Professor Land does not say whether he has any objection to my definition of imaginative representation, nor does he himself offer any other, though he several times hints that he means something different by "imaginability". Thus, at p. 41, he says: "We do not find that they [the non-Euclidians] succeed in this [making metamathematical spaces imaginable], unless the notion of imaginability be stretched far beyond what Kantians and others understand by the word." At the same place, he asserts that only that which can be connectedly constructed in our space can be regarded as "imagined". He adds at p. 45: "Non-Euclidians try to make imaginable that which is not so in the sense required for argumentation in this case". If by "argumentation" is here meant the discussion of the question whether our conviction of the actual validity of Euclid's axioms in our objective world justifies a conclusion as to their *a priori* origin, I am of opinion that my definition of imaginability is the only one that can decide the question. If we should define thus: "Nothing is to be held as imaginable in space, of which we cannot actually construct a model with existing bodies,"—all discussion of the question in dispute is, no doubt, cut short; but then this imaginability, ascribed by the definition to Euclid's space alone, affords not the least ground for deciding whether its origin is to be sought in a law of the objective world, or in the constitution of our minds. Accordingly, I do not believe that Professor Land means to postulate this, though his words bear the interpretation. I can only suppose him to object to my definition of "imaginability" that it does not include a reference to the apparently spontaneous readiness with which the various aspects of any common object are represented when we have sensible experience of some one of them. But we know that such an association of different impressions can be acquired and strengthened by frequent repetition; as, notably, between the sound of a word and its meaning. I therefore do not see that we have the right to consider this readiness of suggestion as essential to imaginability. The fact, moreover, that Lobatchewsky, in the way of pure synthesis, that is to say, by means of actual geometrical constructions, worked out a complete system of pseudospherical geometry, agreeing exactly with the results of analytical inquiry, shows that such a geometry can be grasped in all its details by the imagination.

As regards the use of analytical methods in metamathematical inquiries, this is justified by the circumstance that we have here to do with the representation of an object that has never been perceived—an object whose notion, or (so to speak) architectural plan, has first to be developed, to be shown inherently consistent, and to be elaborated so far in detail as that for every particular case it is made clear what the corresponding sensible suppression would be in the circumstances. Now, this ideal development of the ground-plan is best attained by the methods of analytical geometry, securing as these do most effectively universality and completeness of demonstration. No doubt a manipulation of notions by means of the calculus does not suffice to prove the existence of the object so treated, but the process is sufficient to the extent of proving the possibility of a consistent series of sensible pictures; whence it follows that the space-relations actually perceived in a real world by organs analogous to our own might correspond with a geometry different from Euclid's.

Since then the relations obtaining in metamathematical spaces of three dimensions satisfy the conditions of imaginability required by my definition—and more cannot be demanded in the case of objects never actually perceived—Kant's proof of the transcendental character of the axioms and their *a priori* origin must be pronounced insufficient.

II.

In this second section I will start from the position that Kant's hypothesis of the transcendental origin of the geometrical axioms may be correct though not proved, and will consider of what value this immediate knowledge of the axioms would be in judging of relations in the objective world. I will also, in the first instance, adhere to the realistic hypothesis and speak its language, assuming that our sensible impressions are caused by things really existing in space and acting upon our senses. My object in so doing is merely to take advantage of the simple and intelligible speech of common life and of physical science. I regard this view of things, however, expressly as hypothetical, and I mean afterwards to drop the realistic hypothesis in my third section, when I will repeat my exposition in abstract language, without any assumption as to the nature of real existence.

First of all, we must distinguish between equality or congruence of space-magnitudes as dependent on the assumption of transcendental intuition, and their equivalence as determined by measurement with physical instruments.

I call *physically equivalent* those space-magnitudes in which under like conditions and within like periods of time like physical processes take place. The process most commonly employed, with due precautions, for the determination of physically equivalent space-magnitudes is the transference of solid bodies from one to the other, that is to say, measurement with compass and rule. Otherwise, experience teaches us generally that all space-magnitudes that have been proved equal by a sufficiently exact method of physical measurement, manifest equivalence under every other kind of physical treatment. Physical equivalence of two space-magnitudes is thus a perfectly definite objective attribute of the two, and clearly there is nothing to hinder us from investigating experientially how physical equivalence of one pair of magnitudes is dependent on physical equivalence of other pairs. This would yield a kind of geometry which, in distinction from the geometry founded on the supposed transcendental intuition of space, I will for the time being call *physical geometry.* This in its procedure would have all the character of a physical science.

As soon as we have found the proper physical means for determining whether the distances of any two pairs of points are equal, we shall also be able to distinguish the case where three points, a, b, c, lie in a straight line, because then there will exist no point distinct from b having the same distances as ab and bc from a and c.

We should then be able to seek three points, A, B, C, equidistant from one another as angles of an equilateral triangle, and upon the rectilineal sides, AB and AC, two other points, b and c, equidistant from A. Upon this the question would arise whether the distance $bc=Ab=Ac$. Euclidian geometry answers, yes. *Spherical* geometry would say that $bc > Ab$, when $Ab < AB$; *pseudospherical* geometry would say the opposite. Here then, at our first steps, we should find we had to settle our axioms.

I have chosen this example because the question is only about equality or inequality of distance between pairs of points or, in the case of the three points in one line, about the determinateness or indeterminateness of their position, and no complex construction has to be imagined. That the supposed transcendental knowledge of axioms cannot be brought to a decision in this case, because it involves the behaviour of physical bodies, is granted by my opponent.

But my opponent is of opinion that besides this *physical* *geometry* which takes account of the physical (as well as the geometrical) properties of bodies, there is also a *pure geometry* grounded solely on transcendental intuition—that we have, apart from experience, a representation of geometrical bodies, surfaces, lines, that are absolutely rigid and immovable, and yet may stand in the relation of equality and congruence. I add that we are bound to claim absolute exactness for this transcendental representation of straight lines, equal distances or equal angles; otherwise, we could not say whether two straight lines prolonged to infinity will intersect once only or twice, or whether every straight line that cuts one of two parallels must also cut the other lying in the same plane. Now, supposing we had satisfied ourselves, on stronger grounds than have ever yet been adduced, that we do possess intuitions of this kind, we should in fact be in a position to work out a transcendental geometry, and then insure its physical applicability to the space-relations of physical bodies, provided it could be determined that the magnitudes which appear to us as equal in transcendental intuition are also to be recognised as physically equal. It is evident, however, that this question cannot be decided by pure space-intuition. Perhaps then by experience? But how? When we rely directly on our sense-perceptions, we are very clumsy in our comparison of lengths or in estimating faint curvatures of line, and since our ability in both kinds of appreciation increases with practice, it is probable that to a great extent, if not wholly, it has been acquired by previous training and by the use of physical means. The retina, in fact, or the hand, is like a compass that we carry about with us.

There would still remain the application of geometrical reasoning, based upon the axioms, whereby we might infer the equality of two lengths or angles not directly measured. But to be able to apply the transcendental axioms we must already have established the equality of a number of lengths or the straightness of a number of lines, which could be done again only with the help of physical instruments; and we must thus, in reasoning from the physical equality of some magnitudes to the abstract geometrical equality of others, employ the very proposition we wish to prove.

Supposing physical geometry had discovered as laws of nature a number of universal propositions exactly corresponding with the transcendental axioms, the most that could be maintained respecting the assertion that space-magnitudes equal to one another in transcendental intuition are also physically equivalent, would be that it was an hypothesis that led to no contradiction. But this would not be the only hypothesis that could be made. The correspondence would also hold if (as I showed in my previous article) physical space were taken as the image of transcendental space in a convex mirror.

That physical geometry and the supposed transcendental geometry need not be in correspondence, is clear from the fact that we can represent them as not corresponding. The way to make apparent the incongruence is implied in my former exposition. Let us suppose physical measurements in correspondence with a pseudospherical space. The sensible appearance of such a space, observer and objects both being at rest, would be the same as if we had before us in Euclidian space Beltrami's spherical model with the observer at the centre. But with every change of the observer's position, the centre of the projection-sphere would necessarily keep pace, and the whole projection would be dislodged. An observer, therefore, whose space-perceptions and judgments of magnitudes either depended on transcendental intuition or were the result of past experience in the sense of Euclidian geometry, would have the impression, as he moved, of seeing all objects changing position in a determinate way, and expanding or contracting differently according to the difference of direction. In like manner, though the quantitative relations are different, we see even in our actual world the apparent relative position and size of objects vary with the difference of distance as we move. Now, as a matter of fact, we are able to judge from the varying visual pictures that the objects about us do not change their relative position and size, so long as the perspective transpositions correspond exactly with the law we have found to hold in all previous experience for objects at rest; we are able also, on the other hand, to infer a motion of the objects whenever there is a departure from this law. And just so, I, who accept the experiential theory of perception, believe that any one who could pass from Euclidian into pseudospherical space would at first indeed think he saw apparent movements, but very soon would learn to accommodate his judgment of space-relations to the new conditions.

I am quite aware, however, that this assumption is one that is formed by mere analogy from what we otherwise know of sense-perception, and cannot be experimentally proved. So let us suppose that the judgment of space-relations could not possibly become modified in such an observer, from the fact of its being connected with native forms of space-intuition. Nevertheless he would quickly discover that the motions he believed he saw were only apparent motions, because they would always be reversed when he returned to his first position; or a second observer would be able to declare that every thing remained at rest while the other changed his place. Thus scientific inquiry at all events, if not immediate perception, would quickly determine what were the physically-constant space-relations, just as by scientific investigation we know that the sun stands still and the earth revolves, although the sensible appearance of the earth standing still and the sun going round in twenty-four hours remains.

What I have said up to this point would, if I rightly understand him, be assented to by Prof. Land, for he himself, following out the example of 'Dr. Mises,' adduces a case of a similar sort. But then it will follow that the supposed transcendental intuition *a priori* becomes reduced to an *objectively false show*, from which we have to free ourselves and which we must try to forget, as in the case of the apparent movement of the sun. There would then be an insuperable contradiction between spacial equivalence as it appears to the native intuition and that which is manifested in objective phenomena. Our whole scientific and practical interest would be centred in the latter. The transcendental form of intuition would exhibit physically-equivalent space-relations only in the way that a map exhibits the surface of the earth—small pieces and strips correctly, larger pieces of necessity falsely. There would not then be a question only as to *manner of representation*, which necessarily implies some modification of the subject represented, but the relations between the appearance and the reality would be such that, while there was agreement within certain narrow limits, the representation would be *false* on a larger scale. In Prof. Land's example of dwellers on a spherical surface, he escapes this conclusion by falling back on Euclidian space of three dimensions. But in the case of pseudospherical space of three dimensions, if we wish to figure limited portions of it in a non-curved space, we must betake ourselves to a non-curved space of four dimensions, and must in any case one way or the other transgress the geometry of Euclid.

From these considerations my conclusion is as follows:—If we really had an innate and indestructible form of space-intuition involving the axioms with it, their objective scientific application to the phenomenal world would be justified only in so far as observation and experiment made it manifest that physical geometry, grounded in experience, could establish universal propositions agreeing with the axioms. And this condition coincides with Riemann's postulate, that the measure-of-curvature of our space must be determined empirically, by measurement. All measurements as yet have shown no deviation from zero in the value of this measure-of-curvature. We can therefore regard the Euclidian geometry as objectively valid within the limits of our present powers of exact measurement.

III.

The discussion in the second section has been confined to the objective sphere, and conducted from the realistic point of view of natural science, whose aim is to comprehend or grasp conceptually the laws of nature. Towards this end perceptive knowledge is either only a mere help or, as the case may be, a false show to be got rid of.

Now Professor Land thinks that in my exposition I confused the notions of "objectivity" and "reality"; that when I asserted that geometrical propositions could be tested and verified by experience, I assumed without foundation "that empirical knowledge is acquired by simple importation or by counterfeit, and not by peculiar operations of the mind solicited by varied impulses from an unknown reality" (MIND V., p. 46). If Professor Land had been acquainted with my different writings upon the Theory of the Senses, he would have known that I myself have always been combating the very assumption he would ascribe to me. I did not refer in my article to the difference between "objective" and "real,"* because it seemed to me to be of no importance for the investigation in hand. To justify this opinion of mine, let us now drop out of sight the hypothetical element in the realistic view and show that there still is a perfectly sound meaning in seeking for a physical equivalence of space-magnitudes, and in deciding by experience as to the truth of propositions that correspond in import with the axioms.

The only assumption we still maintain is that of the law of causation, to the effect, namely, that all mental states having the character of perception that come to pass in us do come to pass according to fixed laws, so that when different perceptions supervene we are justified in inferring therefrom a difference of the real conditions determining them. As regards these conditions—the reality proper that underlies the phenomena—we know nothing: all opinions we may entertain on the subject are to be regarded only as more or less probable hypotheses. But the assumption is the fundamental law of our thinking: if we surrender it, we abandon the very notion of comprehending things at all. I lay stress, then, upon the fact that no assumptions are made here as to the nature of the conditions under which the mental presentations arise. The hypothesis of subjective idealism is equally admissible with the realistic view, the language of which we have been employing.

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* The German word used by me, and translated "real" in the English, was "*wirklich*", *i.e.*, "that which works or acts". "*Wirklich*" has not the implication of "independent existence" that "real" has.

We might assume that all our perceiving is but a dream, only a thoroughly coherent dream, in which presentation after presentation is evolved according to strict laws. In this case, the reason of the appearance of any new mental state having the character of perception would have to be sought in the fact that certain other perceptions, joined perhaps with a consciousness of certain voluntary impulses, had gone before in the dreamer's mind. What we call laws of nature on the realistic hypothesis would on the idealistic be laws governing the succession of mental states having the character of perception. And here, with reference to the question treated above in my first section, I will farther observe that in dreams we fancy ourselves perceiving as well as thinking; that is to say, some of our states arise with the constraining character of perception, others without this as a free play of representation (so far as in the waking state this may be called free). The question, therefore, whether by giving rein to the imagination we might call forth such a series of representations as would correspond, in perception, to a pseudospherical space, retains its full meaning on the idealistic hypothesis.

Now we find, as a fact of consciousness, that we think we perceive objects occupying determinate positions in space. If an object appears thus in one particular part of space and not in another, this must depend on the kind of real conditions that evoke the presentation. We must conclude that other real conditions might have existed fitted to produce a perception of the like objects in a different position. In the world of reality there must be some causes or aggregates of causes determining at what particular place in space an object shall appear to us. These I will designate, for shortness, *topogenous moments, i.e.,* circumstances determining space-perception. We know nothing of their nature; we know only that the occurrence of spacially different perceptions involves a difference of topogenous moments. Also there must be different causes in the sphere of the real, when at the same place we think we perceive substances with different qualities. I will call these *hylogenous moments, i.e.,* circumstances determining the perception of material things. New names are chosen in both cases, to avoid the misleading associations of current expressions.

If now we perceive and affirm anything that involves space-relations, the real meaning of our words no doubt is nothing more than that between certain topogenous moments, the nature of which is unknown to us, a certain relation holds, whose nature also is unknown. Hence Schopenhauer and many followers of Kant have been led to the improper conclusion that there is no real content at all in our space-perceptions, that space and its relations are purely transcendental and have nothing corresponding to them in the sphere of the real. We are, however, justified in taking our space-perceptions as *signs* of certain otherwise unknown relations in the world of reality, though we may not assume any sort of similarity between the sign and what is signified. But if only so much stands fast—that to unlike signs there correspond unlike objects and to like signs there correspond objects that are like in a certain relation or complex of relations, although we may not be able to define it at the time—this will suffice to yield us a real content. The same holds for space-perceptions as for qualities of sensation. Blue and red are qualities of sensation only; nevertheless we are justified in maintaining that a blue surface is physically different from a red surface. When we observe that the most diverse physical processes may go on during equal periods of time in similar fashion at different, but congruent, parts of space, the real meaning of such a perception is, that there may be in the sphere of reality equal sequences and aggregates of hylogenous moments combining with certain distinct groups of topogenous moments, which latter we then call *physically-equivalent.* We may thus discover by observation what special figures appearing in our perception correspond with physically-equivalent topogenous moments; and experience tells us that they are equivalent for all physical processes.

Now in the case of the equilateral triangle, above, the question is only about (1) equality or inequality of distances, *i.e.*, physical equivalence or non-equivalence of the systems of topogenous moments corresponding with these, and (2) determinateness or indeterminateness of the position of a point, *i.e.*, of its topogenous moments. These notions of determinateness and equivalence in relation to particular sequences we can, however, apply also to objects of unknown character. And I thence infer that the science which I have called *physical geometry* consists of propositions of real content and that its axioms are determined by relations that hold in the sphere of the real.

Nevertheless, a geometry based on transcendental intuition is conceivable also. We have only to assume that, without physical measurement, the intuition of the equality of two space-magnitudes is developed immediately by the manner of action of the topogenous moments upon our consciousness, and that the magnitude of the apparent distance of every pair of points depends by the same formula on any three functions of the topogenous moments of each of the points, as the distance in Euclidian space (according to the Pythagorean proposition) depends on the three right-angled co-ordinates of each point. If such a law were given immediately for the perceived distance, our intuitions of space would necessarily satisfy the axioms of

Euclid, however the topogenous moments of the separate points might be in the sphere of the real; for the whole of Euclid's geometry may be developed from that formula for the distance of two points. But then the question would arise whether the equality of the perceived distance and the physical equivalence of the distance depend on the same function of the topogenous moments or not. That is a question that goes beyond the province of space-intuition, and can be decided only by physical investigation. If there is agreement, the fact would have to be signalised as a law of nature, or, as I called it in my former paper, a pre-established harmony between intuition and the real world.

Thus I think I have sufficiently proved that the propositions put forward by me in that paper rest upon no confusion of the "objective" and the "real". By way of conclusion I will bring my results once more together:—

(1) There exists in any case the science that I have called *physical geometry,* and its general propositions are products of experience.

(2) The assumption of a knowledge of axioms by transcendental intuition apart from all experience is *(a)* an *unproved* hypothesis, and *(b)* an *unnecessary* hypothesis, since it explains nothing in our actual knowledge of the outer world that cannot equally be explained without its help: also, as regards our objective knowledge, *(c)* a wholly *irrelevant* hypothesis, since the propositions it includes can be applied to the relations of the objective world only after their objective validity has first been independently proved.

The presumed transcendental knowledge of axioms can thus have at the most an educational value, as helping to a first notion of space-relations.

H. Helmholtz.

V.—PHILOSOPHY IN EDUCATION.

I.

How is Philosophy to be taught? and what is its educational value? are questions which by their form suggest answers similar to those given to like inquiries regarding the Classics, Modern Languages, Natural Science, and History. Accordingly we find our modern compendiums of Philosophy for beginners treating Philosophy as a system of facts to be learned, and apparently assuming that these facts have an educational value similar in kind to that of historical or scientific facts. And here the modern compendium merely develops in greater detail a point of view which seems previously to have recommended itself to the experience of the philosophical world. The lectures of professors of Philosophy have always been attended by the majority of students in the same spirit as those of the professors of other subjects. In finding an answer to so practical a question as How is Philosophy to be taught? we must not neglect a consensus of such generality as this; we must be prepared to find that to some extent at least Philosophy can be taught in the same way, and with the same results as a language or a science. But, while attaching due weight to this general recognition of the Teacher of Philosophy, we must not allow ourselves to be carried away by the methodical form of the modern compendiums. Their form has evidently been consciously borrowed from the sciences, and must not be taken as evidence for more than that certain individuals think that Philosophy can be taught like one of the sciences.

There is, however, another point of view which is supported by much experience in the philosophical world. According to it Philosophy is not like a period of history or a language in which progress is measured by increase in the amount of intellectual associations. It rather resembles good health which is constitutional; or at least good taste, which is imperceptibly acquired by habituation. It partakes more of the nature of character than of knowledge. This view has its finest expression in Plato's identification of Philosophy with διαλεκτική and ἔρως—earnest conversation between sympathetic friends. A man does not know what he really thinks and feels till he converses earnestly with his friend. What he really thinks and feels at such a time, not what he gets passively from a book, is his philosophy. But this conversation is possible only to men who have lived long and virtuously in a well-ordered state, and who have been successful students of the sciences, and have gained experience of human nature. Hence Philosophy cannot be taught to youths like geometry, for youths have no experience of life, and Philosophy is a sort of esoteric experience of life, which at last enables a man to play an individual part in the serious conversations of his friends. A man's philosophy dies with him; for it is his knowledge of himself, his peculiar way of testing what he hears by reference to his own experience; it is the easy movement of his cultivated faculties stimulated by the presence of his friend. Aristotle too seems to hold that Philosophy is not a system of knowledge, but a spirit developed in cultivated society, by which a man knows himself and achieves his own freedom. In the life of pleasure a man makes himself a means to the gratification of his desires; in the life of ambition, a means to social success. If the sources of pleasure or the objects of ambition be withdrawn, such a man is helpless. But the *βίος θεωρητικός* is self-sufficing. In it a man makes his own true self the object of his thought and desire. And yet goodness and good sense are the necessary foundations of this life. Aristotle goes as far as to say that *πολιτική* is the art or science of the *Summum Bonum.* Although on his principles this statement cannot be taken strictly—there being no art of such a divine function as *νόησις νοήσεως*—yet it is highly significant that *θεωρία* is viewed as impossible for man except in society. *Θεωρία* like *διαλεκτική* is the highest result of the experience of a long and brilliant life. The nexus of Aristotle's system is missed, I think, by those who lay stress upon his occasional comparisons of the human *θεωρητικός* with the Divine Being. The *θεωρητικός* is not a solitary thinker who is engaged in working out a system of philosophy for himself. He stands in the closest *philosophical* relations to his city and his friends. He is the man of culture who engages in politics without making them his trade or his amusement. His political action has not a self-regarding end—*ἡδονή* or *τιμή*, but an ideal end—*εὐδαιμονία* in which many participate in a brilliant city. In war such a man is *ἀνδρεῖος*. He meets danger *διὰ τὸ καλόν*—to preserve and illustrate the brilliant everyday life of his city; not to avoid personal disgrace or obtain personal honour. He is a patriot and no mere duellist. *Φιλία* is the bond which unites such men. It is in converse with his friend that a man learns to know himself.

Philosophy then according to Plato and Aristotle would seem to be a mental and moral attitude, the result of long experience rather than any definite body of doctrine which might be directly taught like a language or a science. But perhaps all this is too vague at the present day, and requires for its appreciation actual experience of the conditions of the old Greek political life. The experience of the present seems to favour another view, for we have Professors of Philosophy, who teach in much the same way as professors of other subjects. They teach Formal and Material Logic, Psychology, Ontology, Ethics, and the History of Philosophy. Can these subjects be taught profitably or at all to youths? and if so, how? Does the study of these subjects by youths add to their knowledge of facts, or strengthen their minds as instruments? Does it correct any mental or moral bias likely to be contracted from the exclusive study of objective facts? Does it under any circumstances lend itself to superstition? If, under these heads, we find the various philosophical subjects, as studied by youths, unsatisfactory, we shall be obliged to return to the view which we have just left—that Philosophy is not learned like a language or a science; to see if after all we cannot discover in it something applicable to modern no less than to ancient Greek life.

Let us begin with the History of Philosophy. The success which in recent times has attended the employment of the Historical Method in so many fields of inquiry has doubtless had much to do in making the History of Philosophy popular as an introduction to philosophical studies. But it perhaps does not follow, because one who traces the history of a word studies Philology, that one who reviews the history of an opinion, or rather has it reviewed for him, studies Philosophy. The fact indeed seems to be that the educational value of a course of the History of Philosophy is very small, because the pupil does not know what it is about. He is invited to study the development of opinions, before he knows what an opinion is in the philosophical sense. Aristotle's doctrine of the futility of teaching Moral Philosophy to youths who are yet ignorant of the moral ὅτι is applicable to Philosophy as a whole. The History of Philosophy presents the pupil with a phantasmagoria of views which he cannot help regarding as severally untrue and unreal. Thales, he is told, made Water his principle, and Parmenides the One; the Realists said that Universals are real things, and the Nominalists that they are words; Clarke's standard is the Fitness of Things, and Bentham's Utility. Views presented thus make no impression, but are merely learned by heart, like the names of chief cities and the rivers on which they stand in the old-fashioned geography books. Instead of beginning a boy with the map of the world before he knows what a map really stands for, we ought, it is now admitted, to begin him with a map of his own parish, and show him on it the road by which he walks to school. Now in Philosophy also, if it is to be of any educational value, we must begin the pupil with his own parish. We must appeal to his personal knowledge and interests. That the History of Philosophy owing to its wide range and necessarily sketchy nature cannot do this is, I think, evident. From beginning to end in most cases the youth remains in entire ignorance of what his teacher is talking about. And it is a mistake to suppose that if we make the exposition simpler the pupil will understand better. The simpler the History of Philosophy is made, the more abstract it becomes. If in the course of his History the teacher, from taste or for some other reason, loiters round about some particular philosopher, and gives the pupil a view of his concrete personality and circumstances, there is then some hope; the pupil may be able to exercise his dramatic faculty, and in his own little way, represent the philosopher in question. But as a rule he is hurried on from hieroglyphic to hieroglyphic without being put in possession of the key to open their secret. If, as is sometimes the case, certain of the views thus presented to the beginner manage to make an impression on his mind, it is a false one. The beginner in Philosophy has not had the experience necessary to one who would deal successfully with such a complicated system as the growth of man's thought on the highest subjects. He can take in only the simple or abstract. But there are few subjects which can be presented in an abstract manner without being entirely changed and falsified. There are few subjects in which it is possible to neglect all but one or two aspects. Where we are concerned with the personality of a thinker—for this is what the History of Philosophy is really concerned with—we must be able to enter fully into that personality; his 'points of contact' with his predecessors and successors, of which we hear so much in histories of Philosophy, really affect his surface only; and to study him with special reference to his 'place' in the History of Philosophy, is consequently to take an abstract view of him. It is useful to abstract the phenomena of wealth from the other sociological phenomena from which they are never actually separated, and thus construct the abstract science of political economy; it is useful to abstract the space-occupying properties of bodies, and construct the science of geometry; but only because wealth and magnitude are properties which can be clearly perceived in the midst of others. An epitome of a philosopher's system drawn to exhibit his 'place in the History of Philosophy' is not a property which can be thus abstracted from his life and writings. These must be studied in the concrete. They are misrepresented by the epitome in a way that actual bodies are not misrepresented by geometry, or trade by political economy; and this is the practical reason against the epitome. And further, the general objections to an epitome of philosophical views acquire increased force when we consider that it is intended for the use of those whose tendency is to exaggerate its abstractness. A boy may be a mathematician, as the author of the sixth book of the *Ethics* remarks, but cannot be a philosopher, because the objects of mathematics are δι' ἀφαιρέσεως—abstract or simple, whereas the principles of philosophy or science, as of good sense, are gained by lengthened experience. Now the beginner will regard the views which are presented to him in a history of Philosophy as being much less complex in their relations than they really are—much less complex even than the compiler of the history intended to represent them; he will treat them as so many separate abstractions, clearly-cut shapes, from which, if he is ingenious, he will start to deduce necessary conclusions, as a geometer starts from his definitions. I have heard of a young Berkeleyan who apprehended his author's theory of matter in such an abstract manner as to be able to prove from it the truth of the doctrine of transubstantiation. He will perhaps construct for himself a theory of the development of Philosophy—not a difficult task where the organisms arranged are abstractions framed at will; and he will thus probably give his mind a twist for life. He will have become prone to mere assertion, and careless of matter of fact. On these grounds then I think that to begin the teaching of Philosophy with a sketch of the History of Philosophy is a futile, when it is not a mischievous, procedure. The History of Philosophy is only for ripe students.

Another branch which beginners are often taught is Psychology or the Science of Mind. This, it may be urged, is good. If Philosophy has for its purpose to make us thoughtful, to rescue us from the tradition of phrases, and commonplace immersion in the mere manifold of sense-experience, then surely it is good to make the learner think from the first about the powers and limits of his own mind. This contention is more specious than sound, for it is made without reference to the way in which beginners inevitably look at their own minds, as at everything else—in an abstract way. They acquiesce in striking aspects. Where, as in geometry, a striking aspect is also an important property, and separable without distortion, youths are successful. But they are prone to separate aspects, where this cannot be done without falsification. In his primer of Psychology the beginner is probably told that the mind has the three powers of Thinking, Feeling, and Willing: he hears a great deal about Mental Association, Generalisation, and perhaps Judgment, Ratiocination, and the rest. These terms become to him the names of sharply defined entities; his text-book, if a modern one, of course warns him against the error of so regarding these terms; but his experience is not sufficient to enable him to profit by the warning. He continues to encumber his memory with a fantastical Ptolemaic-like system of the mind. How deep and lasting is the impression made by such early-formed systems of the mind is proved by the nature of the criticisms which make up all but the best philosophical polemics. These criticisms one and all fail in taking opponents too literally. Instead of seeing an intellectual or, it may be, an emotional point of view in an opponent's statement about conscience, or whatever it happens to be—instead of taking the statement in connexion with the man and his life and times, they see only an entity which has no business to be where it is in the system, and must be turned out. Like the Stoics ridiculed by Plutarch, such persons make the mind of man into a wooden horse or a zoological garden.

But, it may be said, we begin the pupil with a *concrete* Psychology—with Comparative Psychology and Physiological Psychology. Here he will be engaged from the very first in a real science. To this it may be answered, why not make him study chemistry, which is easier than the physiology of the brain and anthropology, if it is your object to make him study a science? But let that pass. The fact remains that comparative psychology and mental physiology are advocated for beginners. The following considerations have convinced me that their tendency is most unfortunate—that they lay the foundations of a low scientific *morale*, inspiring the neglect of stringent canons of truth. To be other than mischievous, scientific training must be exact. We cannot entertain as relevant the plea that mental facts are by nature vague, and that mental science consequently cannot be expected to come up to the exactness of the objective sciences. The same plea might with equal justice be urged by the spiritualist against the scientific man who demands that spiritualistic phenomena, so-called, shall submit to the same tests as physical phenomena. If Psychology is a science, it must realise the character of the other sciences. In the first place—it cannot claim to be considered an abstract science like political economy, and screen its inexactness and vagueness by the plea that its conclusions are *ex hypothesi* only approximately true. There is no real parallel between Psychology and Political Economy. The phenomena with which Psychology has to do are so inextricably blended together that there is no practical justification of the attempt to separate one set of them for treatment by itself *in vacuo*, as there is for the separate treatment of wealth to the neglect of the other sociological phenomena. By treating wealth separately, we arrive at valuable practical results. Rational Psychology—the spirit of which too often animates its professed opponents—has not been justified by results. It has not given us any nearly true description or laws of mind. The 'Laws of Mental Association,' as we have them in our books, seem to me to reproduce merely in a more specious form the abstractions of the Rational Psychology of the past. These latter abstractions, once created, were often left to stand by themselves for what they were worth. But the 'Laws of Mental Association' are systematically employed as principles of psychological explanation, and have thus become the sources of the multiplication of abstractions. They are too general, as they at present stand, to serve as principles in such a concrete inquiry as that regarding the precise nature and genesis of this or that mental state. Doubtless each particular mental state has its laws; but we do not know them. When Cuvier deduced the marsupial type from the examination of a fossil jawbone—a deduction afterwards verified by the discovery of the entire skeleton—he was enabled to do so because he knew from previous observation the precise law connecting a *particularly-formed* jawbone, with a particular type of skeleton. It would not have availed him much to know generally that every jawbone implies an entire skeleton. But this seems to be the amount of knowledge deemed sufficient by the manipulators of the 'Laws of Mental Association'.

In the second place, Psychology does not realise the type of an experimental science. An experimental science has to do with objects which are so definite that there is no danger, with proper care, of mistaking one for another—with phenomena which recur exactly as they have before occurred. It demands exact measurements, giving results which may be expressed mathematically, and thenceforth constitute the principles of a deductive extension of the science. Take, for example, that branch of physics of which the spectroscope is the instrument. Here we have certain lines always recurring exactly as they have before occurred, which cannot be mistaken one for another, and the intervals of which can be measured. The identification of an absorption-line observed in the solar spectrum with a bright line caused by the flame of a known substance burnt in lamp depends for its success upon the definiteness of the phenomena, their constancy, and the possibility of exact measurements. The lines of iron, for example, are very numerous, and are distributed in complex groups over several parts of the spectrum; to detect iron in the sun implies that these lines in their arrangement and distances are constant, and that exact measurements are possible. Now let us ask regarding mental phenomena—Are they so definite that there is no danger, with proper care, of mistaking one for another? Do they recur exactly as they have before occurred, like the lines of iron in the spectrum? Or is memory, which in Psychology takes the place of natural recurrence, of such a character as never to present us with the same object a second time? There can be little doubt, I think, as to the answers to be given to these questions. Psychology is not a science after the type of spectroscopy.

But perhaps Psychology realises the conditions of a comparative science, like biology. What are these conditions? The objects must be so definite and constant that not only we shall not mistake them one for another, but that we shall be able to detect their minutest properties; for the classifications required by biology often depend on the detection of rudimentary organs of a very minute kind, and exhibit series of organisms and organs passing into one another by fine gradations. It is the definiteness of these objects and their constancy under minute examination which render a science of biology possible. And moreover they are objects which repay the minutest examination, for they are 'Natural Kinds,' and their properties are inexhaustible. Had examination sufficiently minute to detect obscure rudimentary organs been impossible, biology could not have reached its now leading conception of development, founded as that conception is upon such discoveries as these—that the flowers and fruit of plants are modified leaves—that the wing-cases of beetles are transformed branchiæ. Now can Comparative Psychology satisfy the foregoing conditions? Are the mental states which it tries to classify and arrange serially in the order of development so definite as not to be mistaken one for another? Is their nature constant? Do they lend themselves to minute examination with a view to the detection of rudimentary organs so essential to a classificatory science such as Psychology professes to be? We fear that rudimentary organs are little known in Comparative Psychology—that it makes much greater use of what Mr. Darwin calls analogical or adaptive resemblances—that in short all its cetaceans are fishes. It is easy to see how precarious must be the thread which guides the comparative psychologist in tracing a mental state back to its origin. He can pass from one link to the next only on the strength of some resemblance—and what if the resemblance be merely 'analogical'? At some stage or other of his investigation, owing to the nebulous nature of his objects, he is morally certain to be thus drawn from the path; and even if he did keep to the path, his success could not be verified—could not be distinguished from failure. In one word, Psychology is not a comparative science because it cannot detect rudimentary organs, its objects not being 'Natural Kinds,' but phenomena which change and vanish under the attempt to examine them. This, I think, is what must be said of the scientific claims of Psychology. To begin philosophical instruction with it is mischievous. The crude admixture of psychology which finds a place in so many of our elementary books is of course indefensible as information offered to beginners. They know nothing of physiology from direct observation, and are simply demoralised by being made to commit its language to memory. They create for themselves a mythology of the nerves—as essentially metaphysical as the mythology of the faculties against which they are warned; they learn the too-easy lesson of accepting mere assertion for discovery, and the loose concatenation of ideas for progress in investigation. The proper time to study Psychology is not before, but after a man has become acquainted with the facts and methods of some one of the sciences properly so called, or at least has gained ordinary experience of the kind of evidence required by practical men of culture for alleged facts and events. As it is, however, Mental Science (we shall speak of Logic afterwards) is the science with which the majority of educated men—those whose education has been literary and not properly scientific, or mathematical—are principally acquainted. They know nothing of chemistry, or physics, or biology, or other objective science, but they have read some mental science in early youth. It is the only type of a science which is present to their minds through life. Such persons cannot fail to have an erroneous conception of the nature of a science. Many of them accordingly pass easily on to ontological fields, in which all can be proved to the satisfaction of those who do not know what proof is, and who have never learned the first lesson of criticism—that the procedure of the natural sciences is merely a consistent illusion when employed in a region beyond the limits of possible experience.*

* In a rejoinder to a paper by the present writer in MIND, No. IV., M. Straszewski, writing in the *Revue Philosophique* for October 1877, seems to labour under a slight *ignoratio elenchi.* The present writer maintained in that paper that the objects (in the plural) of Psychology—meaning the various conscious states—are not definite enough, clearly and distinctly enough perceived, to admit of scientific treatment. But M. Straszewski's paper proceeds upon the assumption that the present writer asserted that the object (in the singular) of Psychology—meaning its γένος or sphere, consciousness—is not rounded-off. He accordingly is at pains to show that consciousness is *sui generis*, and—on the principle, I suppose, of μία ἐπιστήμη ἑνὸς γένους—that therefore Psychology is a science. But the proposition 'Every science has a separate field' cannot be thus converted simply. While allowing with M. Straszewski that the field of consciousness is separate from all others, and while admitting that *if* there were a science in this field it would be virtually an independent one, I hold that there is no science in this particular field, because the objects or phenomena contained in it are of a nebulous character. The tides *e.g.*, are sufficiently themselves to be treated by a distinct science, *if* we knew enough about them. In short, M. Straszewski transforms 'Every ἐπιστήμη has its γένος' into 'Every γένος has its ἐπιστήμη'. His article is a fine example of the prevalent malady of supposing that the words of science have a charm to bring form out of any matter. Because the methods of the objective sciences are so successful, we are told that we must also apply them in the explanation of Mind. This mere recommendation, expanded at length, is the real foundation of the opinion that Psychology is a science ; for Comparative Psychology after all never gets farther than *prolegomena* to the effect that the methods of the organic sciences have effected marvels, and that accordingly we must compare mental states in the various stages of their development, that we must deduce results from the Laws of Mental Association, and then verify them by observation, and so on with the whole vocabulary of the comparative sciences. But this Science of Mind terminates with these *prolegomena*, which might equally well serve as *prolegomena* to any other comparative science. The few illustrations given of the development of conscious states *as such* cannot serve as evidences of the existence of a *science* of them, because conscious states as such are not minutely known and definite organisms which can be serially classified and whose rudimentary characters can be

But still the fact remains that Mental Philosophy has been and is taught with profit to many. Its scientific aspect must therefore be a false appearance which it puts on, and its real nature must be after all what the highest Greek experience felt it to be. It must be an ἦθος and not a body of doctrine. In order to discover the nature of this ἦθος, we have to inquire how a man may become better otherwise than by increasing his knowledge of facts, and acquiring technical skill, virtuous habits and good manners. It is obvious that it is possible to be excellent in all these respects without being thoughtful—without reflecting upon one's knowledge or habits. It is the function of philosophical education to encourage this habit of reflection. In a former paper in this journal I attempted to show that in England Locke and his two great successors are chiefly significant for performing this function; and all great philosophers are, I think, significant in this same way. During the Socratic age this function was performed with accessories which cannot now be adequately reproduced. The enthusiasm which made a man aware of his real thoughts and feelings, and the shame of pretended knowledge exposed, were accessories of the dialogue which made it the most effective means of awakening reflection. But before these emotional accompaniments of reflection could be experienced, the young man must have already acquired the reflective or philosophical ἦθος to a considerable extent. We have here to inquire how reflection may be aroused in a mere beginner, in one who is entirely immersed in matter. How shall we suggest to him that the things which his senses present are not exhausted by eye and touch—that it is also possible to think about them? Especially, how shall we suggest the idea that moral distinctions have more than a particular significance? He accepts as ultimate facts that this neighbour is fond of money, and that other vain; that so and so risked his life in

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detected. Where Psychology really does good work, as in the hands of such observers as Weber and Fechner, it is not concerned with conscious states viewed in themselves, and in their relations among themselves, but with those only which can be distinctly connected with bodily stimuli. But when M. Straszewski brings forward the undoubtedly scientific discoveries of this Psychophysics as conclusive against my general position, he is unfaithful to the truth from which he himself starts, and which he accuses me of denying, that consciousness is a γένος distinct from the *physique*, &c. My position is that Psychophysics is scientific; but that the *prolegomena* which I have mentioned are not *prolegomena* to it, but are an essentially metaphysical attempt to extend the methods of the good sciences to a ὕλη (not the sensations of Psychophysics, but the higher conscious states as such) which is receptive of *scientific* forms in a sense as illusory, so far as exact science is concerned, as that in which noumena were receptive of the Categories of the Understanding in the scholastic metaphysic discredited by Kant.

attempting to save another's life, and that so and so embezzled trust-money. He is evidently no moralist. But the beginning of Moral Philosophy is to frame for ourselves ideal embodiments of the more striking characters known to us, as we have it done in the fourth book of Aristotle's *Ethics* and in Theophrastus—to dramatise them, to think and feel about them. 'Poetry is more philosophical than History'; philosophical education consists in withdrawing the pupil's mind from the mere particularity of 'history' or 'personal talk,' to 'poetical' objects, creations, works of art. How then is this education to be *begun?* Not, we think, as might at first sight seem proper, by presenting to the pupil moral creations like Aristotle's for his contemplation. He would be sure to treat them not as creations but as particular men described. As Plato felt, poetry is not for the vulgar, who receive its myths or creations for facts. The beginner must first be made aware that it is possible to think about things which are not directly objects of sensation. This can be best done, I think, by means of Formal Logic.

In Formal Logic the beginner is introduced to a system of objects which are not objects of concrete sensation. He begins to *think*. It might of course be possible to make him *think* in other fields, to withdraw his mind from its immersion in sensible particulars to the consideration of their constant relations or laws. But we have seen that youthful thinking is necessarily abstract; to make the beginner think by instructing him in the laws of natural phenomena would accordingly be dangerous—he would think by means of *notiones temere abstractae.* Hence the advantage of first stimulating reflection, or withdrawal from the purely *naïf* objective point of view, by means of the abstractions of Formal Logic which stand by themselves and are less likely than other abstractions to falsify the beginner's view afterwards of any class of objects. That a new epoch is made in the mind of a youth who studies Formal Logic sufficiently far to become interested in its details is matter of common observation. Excelling in the study of τὰ δι' ἀφαιρέσεως, he has them here in their safest form. The abstractions of mathematics would not serve our purpose of supplying him with a gymnastic preparatory to real reflection afterwards on the manifold of the natural and moral worlds. Mathematical reflection is too special in its reference. But Formal Logic is a general gymnastic for the philosophical life. It is a means of laying the foundations of the habit of occupying the mind with other objects than those presented to the senses. At the same time it can easily be cast aside when it has performed its gymnastic function. It is a system of abstractions, and as such can be easily apprehended by the young; but it is a system of abstractions which does not necessarily falsify any realities, and indeed illustrates Grammar with which the pupil is already acquainted. Formal Logic makes a boy reflect upon Language with which he is already familiar; the habit of reflection thus formed will afterwards operate upon experiences which he has not yet felt, although he may know their names. Of course Formal Logic must be taught with great caution, lest it should supply the framework of a Rational Psychology or of a Metaphysic afterwards. It is merely gymnastic, and ought to be cast aside before a constitutive use can be made of its formulæ. Applied Logic, however, is, I think, under all circumstances dangerous for mere beginners in Philosophy. It comes forward expressly to give rules of scientific procedure. But the pupil is ignorant of the sciences, and can only derive injury from learning their methods by heart. He will be sure to take an abstract view of these methods, and to ignore the ὕλη which forms the real difficulty in scientific investigation. The Logic of the Sciences ought to be left till a comparatively late period in the philosophical education. But it generally follows immediately upon Formal Logic. The pupil is introduced to methods which he receives in the same abstract way as he receives the formulæ of Pure Logic. But there is this difference between these formulæ and the scientific methods, that the former are best treated in an abstract way, whereas the latter, by being so treated, lose their value. They are valuable only to one who can clothe them with his own concrete scientific experience. A beginner, if he is to study the Logic of the Sciences at all, ought to read works like Herschel's *Discourse on the Study of Natural Philosophy*, or Darwin's *Origin of Species* or *Coral Reefs*, where the scientific methods are immanent in the concrete experience. Works which exhibit these methods nakedly, valuable as they may be for the more advanced, are unfitted for beginners, because they encourage their natural tendency to take an abstract and premature view of concrete sciences which they have not studied. The system, in short, which teaches the methods of the sciences to those who are ignorant of the facts of the sciences cannot be defended from the educational or any other point of view.

I should trust then to Formal Logic, which ought to be learned at school, to give the beginner's mind the necessary gymnastic preparation for Philosophy. But, although he has practised the gymnastic, he has not yet begun Philosophy. How shall we now proceed? Metaphysics, Psychology, the Logic of the Sciences, and the History of Philosophy, are all out of the question. They all lend themselves to, and exaggerate the natural tendency of the young and inexperienced to abstract or thin thinking. We must make the pupil, who now has had some practice in the form of reflection, acquainted with one of the great masters of reflection in the reality of his own writings. We must, in short, make him read a *Classic*—critically, and with a view to all its merits, literary and ethical among the rest. One of the lessons, for example, which the young Englishman will learn from the study of Locke's *Essay* will be to admire the man. This is perhaps the nearest thing we now have to the Socratic Dialectic, that living philosophy between friends—master and disciple. But the classic which we put into the hands of our pupil must not be one which reveals itself easily and at once. That would be ῥητορική, and not διαλεκτική. It must be a book which makes its reader feel that he is being examined by it rather than reading it. To illustrate what I mean—Locke's *Essay* is better for the philosophic novice than Berkeley's *Principles.* Accordingly, not to frustrate this dialectical function of a great classic, the teacher in explaining it ought to avoid giving his pupil, at first, views of the *ensemble,* and to confine himself to the removal of particular difficulties. There are philosophical classics which have been rendered educationally worthless by the essays prefixed to dominant editions of them. With regard to the choice of a classic to begin philosophy with—this is not of nearly so great importance as the avoidance of mediocre writers. Philosophical education may be generally described as the study of the great philosophers, just as education in natural science is the study of nature. Yet there are reasons to determine the choice of a classic. The philosophical ἦθος does not supervene by a miracle; it is the development of the pupil's previous education. Hence for those whose school-training has been classical, Aristotle's *Ethics,* is, I think, far the best book, especially if it be connected by means of the *Politics* with the student's previous knowledge of Greek history and life, which, owing to their remoteness and the splendid literary medium through which he has been accustomed to see them, have already acquired an ideal and artistic form in his mind. In the *Politics* and *Ethics* he will find this form elaborated for him by a master's hand; he will be introduced to a world of moral creations, and will experience a curiosity which he never before experienced in connexion with the mere objects of 'personal talk'. He will perhaps feel something akin to that Wonder, which is said to have been the beginning of the Greek Philosophy of Nature, when he thus finds himself in the world of the higher nature with its various moral forms definite after their kinds, and revealing an order and an end of which the natural world is a type with its plants and animals, all after their various kinds, realising definite forms and limits of growth.

There is surely something in this large vision of moral order and purpose to impress one whose eye has hitherto only wandered from neighbour to neighbour, regarding their various characters as all equally natural, and all equally inexplicable in their particular isolation.

If it be asked—What is the use of the philosophical ἦθος thus produced by the study of the great philosophers? I ask in turn—What is the use of Music or Poetry? The question is meaningless. The philosophical ἦθος, like poetical taste, is a form of the higher life. Few men can be creative in the philosophic fine-art; but many can derive profit from the study of philosophic creations. But as these creations are presented in a literary form from which it is impossible to abstract them without distortion, those who would study them with profit must approach them in the literary spirit in which they were conceived by the artist. This is particularly important in the study of Plato, whose Ideas are misunderstood without literary tact; of Aristotle, whose system is much more poetical than it seems; and of Kant, in whose ethics Duty stands to everyday life in much the same figurative relation in which it stands to the stars in Wordsworth's ode. Greek Philosophy cannot be assimilated without Greek Philology; and our great English philosophical classics must be read with a sense of the literary temper produced by the peculiarities of the times in particular writers. These peculiarities being small relatively to the present time as compared with those which moulded the form of Greek literature are less easily detected by us; and hence it happens that Greek Philosophy is easier for beginners than English Philosophy. Many youths have received the true philosophic shock from Aristotle; but Butler's *Sermons*, with all their greatness, are at first only sermons. Considering the previous school and university training of our beginners in philosophy, I think then that it is wise to make philosophical education at first an extension of their Greek reading, and to begin them, as at Oxford, with Aristotle's *Ethics*. In the Scottish Universities the system of separate years and classes encourages the study of Philosophy *per saltum*. A student there seldom, I fear, feels the continuity of his Greek and Moral Philosophy classes. With regard to German Philosophy—it is not for English beginners. Very few of them know German, and therefore cannot study a classic written in that language; and no classic can be translated. The avidity displayed at present by mere beginners in some quarters for the English tincture of certain German philosophies partakes more of the nature of an epidemic than of a genuinely philosophical movement. It is a movement which, contrary to what I consider to be the proper order of philosophical education, brings the pupil at the very first face to face with abstractions which he is compelled, at his time of life, to receive as real things. He cannot be made to feel, as when he studies Formal Logic, that he is engaged in a mere exercise of gymnastic. He lays the foundations of superstructures which would have astonished the original German philosophers.

Teachers and students of Philosophy fall into all the evils of sectarian narrowness and animosity when they forget, as they too often do, that the philosophical training is after all a *literary* training, and is concerned with moods of mind rather than with objective truth—that it is as much beside the mark to wrangle over the truth of a Philosophy as over the truth of *Paradise Lost.* People of defective culture accuse poets and artists of misrepresenting facts. Poets can only demoralise such people, and ought to be expelled from their Republic. It is criticism which distinguishes moods of mind from objective truths or facts, and which shows, on the one hand, that a mood is often mistaken for a fact, and on the other hand that a mood has its own independent value, and that it is irrelevant to ask concerning some moods whether they answer to facts or not. The former of these two functions of criticism is generally distinguished from the latter as the philosophical from the literary. In Bacon, Descartes, Locke, Berkeley, and Hume we trace the development of philosophical criticism. In Kant we have not only the culmination of previous philosophical criticism, but also an indication of the essential connexion between the philosophical and the literary points of view. He showed that the old scholastic Metaphysic of the Understanding is an illusion, but, by the *rôle* which he assigned to the Ideas of the Reason, indicated the reality of another Metaphysic constituted by the play of the fancy and feelings, and finding its expression in religion, morality and art. The lesson which he thus implicitly conveys is that it is by entering into the fancy and feelings of a philosopher, as these have given themselves literary expression in his writings, that we shall best understand his philosophy and derive philosophical benefit from it.

Thus we are brought round again to our conclusion that Philosophy must be first studied in those authors whose literary spirit is most easily caught by students with a certain previous training. Philosophy is the study, in their full concreteness, of the writings of the great philosophers. There is no Philosophy to be derived by a beginner from the Epitome and the Primer. The study of these belongs to the Pathology of Philosophy, and may be taken up by mature students who have a taste for specialisation.

J. A. Stewart.

II.

A timely question is raised in the foregoing paper, and answered with great directness and vigour. The question is opportunely raised at a time when the Civil Service Commissioners, whose sway gains with every year upon the higher instruction of the country—as new classes of appointments are thrown open to competition—have decreed that Moral Science shall cease to figure by the side of Logic in the scheme of the long-established Indian examination, giving place to Political Economy. This change was invoked with more than prophetic exactness by Mr. A. J. Balfour in the *Fortnightly Review* of August last, before the issue of the revised scheme, and its significance is not the less that a year earlier another public body, the University of London, as noted at the time in these pages (No. IV., p. 577), was moved in whatever spirit to throw away one of the chief distinctions of its examination-system when it ceased to require of all candidates for the degree of Bachelor of Science some knowledge of Logic and Psychology. Now comes Mr. Stewart's argument, conceived from a quite independent point of view, yet so running in part—where he puts forward Logic but makes conditions about Philosophy—that it might be read almost as a justification of the precise action of the Civil Service Commissioners (or Indian Secretary). Such an apparent consensus of opinion is too remarkable not to require some consideration of its grounds. There may also be some use in confronting with the recommendations of an Oxford lecturer those which a different kind of practical experience would suggest to another teacher. And in a journal that was founded mainly on the faith of the existence of a properly scientific doctrine of mind, it seems right not to pass over some observations that Mr. Stewart makes by the way on the character of Psychology.

First, a few words on the opinion expressed by Mr. Balfour in the course of a general argument on the Indian examination. In his judgment, Moral Science—meaning Metaphysics and Ethics—fails to satisfy every one of the conditions of a good examination-subject, while Political Economy satisfies them all. The effort of memory, he says, in mastering the subject, should be small compared with the effort of intelligence; it should be easy to distinguish an answer that shows a merely skilful use of the memory from one that shows an intelligent grasp of the subject; and there should be substantial agreement respecting the body of doctrine in which the examination is held. Waiving the point whether in this last respect Political Economy does at the present day stand in a better position than Moral Science, I should doubt whether his third condition is of as much practical importance for the ends of a selective examination as he deems it, while as to the other conditions it surely might be contended that they are very exceptionally satisfied by Moral Science. There can be no question of "mastering" this subject by effort of memory, nor will an examiner, if he knows his business, have much difficulty in judging whether a student is merely remembering or understands a philosophical doctrine. The question, however, that I should like to put to Mr. Balfour is whether it is his opinion that Moral Science should not be studied at all by the class of men whence Indian civil servants are drawn. If this is not his meaning, the true way of dealing with the examination should rather be to make it more stringent. What I suppose Mr. Balfour really to mean is that a smattering of philosophical knowledge is not, like some other smatterings, a harmless mental possession; and this may be freely allowed. It is an evil if hitherto men have been tempted to "get up" a little Moral Science, under the impression that it was an easy way of securing marks. Whether the marks were secured or not, the men are likely enough to have suffered mentally and morally by the venture. But the remedy is to take care, by the nature of the examination if not otherwise, that candidates shall have gone through some real and deliberate study. If it be said that this cannot be provided for, but rather the subject must be dropt out of the examination-scheme as not a "good" one (in the sense of Mr. Balfour's conditions or any other), the effect will be to confirm those people in their opinion who think that the public competitive system attains its end at a ruinous sacrifice. The mechanical exigencies of the system, thus applied, might easily prove the death of higher academic culture in the country. It may not be desirable that as many youths should take up with Philosophy as with Mathematics or even Political Economy, but those who follow the philosophic call that comes early to some should not therefore be excluded from the public services.*

Coming now to Mr. Stewart, I find much to agree with in his positions. It is a very senseless or even mischievous proceeding to begin the study of Philosophy with a general view of historical systems; nor could the reasons against such a course be more forcibly or accurately expressed than by him. It may also be, and doubtless it often happens, that a beginning is made with Psychology in circumstances such that the step is as inappropriate as he describes it. Neither is any fault to be found with his recommendation to begin with a course of Pure Logic: some teachers do this regularly with great advantage to their students, and even boys and girls at school, as Mr. Stewart rightly urges, may thus be led on, almost insensibly, from their grammatical lessons to a first understanding of the philosophical point of view. As little would one think of contesting his view of the general mental discipline that comes of really intimate converse with any of the master-spirits whose thought is of the cast that withstands all change of time.

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* It is only an act of bare justice to acknowledge that the Civil Service Commissioners show the most anxious desire to secure an effective system of examination, and to this intent are never slow to modify their practical regulations in the light of new experience. Nor can it be doubted that the present change in the scheme of examination-subjects—a far more serious matter than a change of working-rules—is meant in the interest of thoroughness. But has it been duly considered in the light of its effect upon the higher instruction of the country? The lowering of the maximum age of candidates for Indian Civil Service appointments, from 21 to 19, makes an important difference in the case of this particular examination; still the change, as affecting one of the recognised branches of academic instruction singly, is ominous all the same, and it will press hardly upon students in those parts of the country where Philosophy is studied most and earliest.

Is Philosophy, however, only such an ἦθος as Mr. Stewart would make it? The analogy with Poetry has its foundation. In the depths of your being you feel thus or thus, and if you have the gift of utterance you burst forth in measured strain or lacking spontaneity you revel in this or that poetic creation of others. So of one's philosophy it may be said that it is simply how one tends to think of all things—the general and ultimate expression of one's intellectual personality. You cannot prove a philosophical as you prove a scientific theory: you take it or leave it. Still a philosophical, like a scientific, theory assumes to be a subjective expression of objective fact. One studies the system of a philosopher not expecting to have one's assent extorted as by scientific demonstration, but yet with the aim of being brought to a state of intellectual acquiescence. It is therefore no matter of indifference what systems of philosophy we shall study. The classical student will very naturally turn to the *Republic* or the *Ethics*, and if he really enters into the mind of Plato or Aristotle, will end by being more than a scholar; but if his first object is to obtain philosophical insight —help and inspiration in comprehending himself and the world that he knows by common or (as even a classical student may to some extent know it) by scientific experience—he is more likely to find what he seeks in thinkers nearer to his own time and circumstances. So it is very well that the "young Englishman" should learn to admire the sterling qualities of Locke's nature, intellectual and moral, as they shine forth from the pages of the *Essay;* but he may be helped to see farther into things and have more guidance in ordering his life if he will study those masters who think on a basis of better-ascertained experience, physical and psychological, than Locke did. It is the true Oxford note that is heard in Mr. Stewart's injunction—"Read a Classic". Classics, whether ancient or modern, are worthy of all regard, and it may be hoped that by this time we are all alive to the duty of assimilating into our consciousness whatever is best in the record of human thought. But the philosophical craving, once it is really awakened in any mind, is not to be satisfied by the æsthetic contemplation of a past thinker's work, be he called Locke or Aristotle. Philosophy is not therefore Literature, because there are theoretic as well as practical grounds for distinguishing it from Science.

Even when he appears to be pleading the cause of true as against sham science, the ways of study at Oxford are still uppermost in Mr. Stewart's mind. It is in the interest of Science, not of Literature, that he deprecates the practice of beginning a philosophical course with the study of Psychology, and is led on to urge his objections against the claim of psychological doctrine to rank as scientific. These will be considered presently in their material import. Viewed in their educational bearing, their force seems wholly to depend on one assumption —that the average Oxford student with his public school training in classics or mathematics represents the case of all youths who are brought into contact with philosophical questions through the portals of Psychology. Put the case that a student, besides being fairly read in ancient or modern literature, is acquainted not only with the principles of mathematical reasoning but also to some extent with the experimental methods of physics and chemistry and even with the procedure of biology—how will he suffer in intellectual character by being set to see the processes of science brought to bear on the facts of subjective consciousness? If he knows nothing of the ways of science except what he can learn from Euclid, he may indeed be exposed to the dangers which Mr. Stewart forcibly depicts, but the fault lies with his previous training rather than with Psychology, which might perhaps, by the very nature of things, be no more strict a discipline than Mr. Stewart would make it without therefore either losing the character of Science or ceasing to be the best introduction to the study of Philosophy. It might be supposed too, from the vehemence of Mr. Stewart's argument, that in this country great numbers of students are every year being set to learn from psychological primers, and that all of them, by reason of an exclusively literary or merely mathematical training, are exactly in the condition to have their minds hopelessly perverted in the process. So far as I know, there exists no psychological primer in the language; the number of students, in England at least, that take in any way to Philosophy, is relatively very small; the number of philosophical students anywhere in Britain that are introduced to Philosophy through Psychology is not great; and those of them who in such a case use books like Mr. Spencer's *Psychology* and Prof. Bain's larger or smaller treatises are not in general so ignorant of physical science as to be in serious danger of misunderstanding everything in the direction of Mr. Stewart's fears. At least, if they study with a teacher who himself understands, they may easily enough be kept from taking everything in an "abstract" sense—so far, that is to say, as they ought to be: physical science when it experiments, biology when it experiments or compares, neither of them can help "abstracting".

The indictment brought by Mr. Stewart against the scientific standing of Psychology comes altogether to something like this: Psychology is not a science, because it is neither abstract like Mathematics or Political Economy, nor experimental like Physics or Chemistry, nor comparative like Biology; because, that is to say, it deals neither with such a mere aspect of things as number or figure or such a separable phenomenon in social life as wealth, nor with manageable and measureable physical events, nor with organic forms which if they grow and change have an inexhaustible variety of perceptible attributes preserving fixed relations with one another at every stage. And it is all quite true: Mind is no such quality of objective things as even life, to say nothing of physical motion or figure and number. Mind is the name for just that which is most opposed to what we call objective qualities (though these themselves in ultimate philosophical analysis are easily shown to have an expression in terms of mental experience). But what follows? That there can be no such thing as true statements regarding mind as it appears in you and in me and all our kind? That your subjective experience and mine have not common limits and are not developed according to definite laws the same for us both—laws and limits alike ascertainable? That, in short, there is nothing that can be called psychological science; but if we would take heed of our inmost nature it must be in the way of personal fancy guided by the example of some classical philosopher, ancient or modern? So Mr. Stewart seems to think. But not so think all the best philosophic heads of English name for some two centuries back. Not so think in ever increasing force the most active spirits of other countries where the philosophy of subjective fancy has taken its boldest flights. These have laboured and labour with the difficulties of subjective observation which they know to be most real, and with the graver difficulty of verifying or proving universally valid the relations which the introspective observer finds or thinks he finds among the facts of his own conscious experience.

They have gradually, as the objective sciences, especially physiology, have been slowly developed, acquired the habit of giving greater fixity to their subjective expressions by connecting them, wherever possible, with phenomena of the bodily life—a practice as perfectly legitimate from the scientific point of view as anything could be. They have also, in the most recent time, come to see that mind may be studied not only in its direct bodily manifestations but also in its *products*—in manners and customs, social or religious, and in all the variety of objective phenomena that are the special care of the anthropologist and comparative psychologist; which is again a practice the legitimacy of which cannot reasonably be questioned if it results in the least grain of insight. When all is reckoned, the insight acquired is doubtless defective enough, and the most hopeful psychologists who are wise have the fullest sense of what remains to be done before the scientific title of their doctrine will gain general recognition. At present, imperfect as the doctrine is in many ways, its scientific title is denied less on that account and less on account of the real difficulties that must ever beset its procedure, than simply because its subject-matter (as its champions even more than its foes will contend) is disparate from that of any other of the sciences commonly allowed. Unfortunately, also, with this disparateness of psychological facts and with the acknowledged difficulty of verifying general assertions about Mind, there exists for every man the most perfect facility of expression respecting his own inner experience, which may be straightway taken as representative of all. Hence a popular opinion, laid hold of and systematically applied by some metaphysical thinkers, that a special or technical science of Mind is a superfluity. Mr. Stewart is not of that opinion, for he desiderates the science he denies; but the way he would have Philosophy studied seems curiously well calculated for hindering the growth of an effective Psychology.*

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* The really serious charge, not overlooked by Mr. Stewart, that may be urged against Psychology as it now stands, touches the vagueness and generality of its statements. Even in the most scientific of modern psychological treatises there appears little disposition (as the Scotch say) "to condescend upon particulars," and it does not very plainly appear in the books what advantage is gained by restricting the search to phenomenal explanation after the approved manner of the positive sciences, instead of having recourse to metaphysical entities like the "faculties" of the older theorists. No doubt, the business of a scientific manual or theoretic treatise is not to deal with special cases, but to embody general results and to enunciate abstract laws. The true sign, however, that laws proper have been established in any subject, is when they lend themselves to the explanation of particular phenomena, and inevitably suggest deductive applications to be verified by actual experience. The true sign that a science has reached (in its measure) the positive stage,

For my part, be the imperfections of present Psychology what they may, I cannot hesitate to maintain that with Psychology and nothing else the beginning of express philosophical study should be made. Whether or not it may be expected that men will agree in philosophical as in scientific matters, I differ from Mr. Stewart in assuming that it is desirable they should; because Philosophy aims at the expression of a certain kind of truth and, though there may be different kinds of truth, there is but one truth of the same kind. Besides, it has always lain in the notion of Philosophy that the insight obtained should be subservient to conduct, and this makes philosophising a serious business in life, not a mere piece of self-indulgence. Assuming, then, that men are to be brought, as far as may be, to agreement in philosophical conclusions, I desire that the beginning of philosophical study should be made upon ground where agreement is most easily attainable, and this is afforded by Psychology. But here a particular conception of Psychology is, no doubt, implied, and this should be well understood. It is implied that Psychology, while it has an altogether peculiar matter in dealing with the subjective life of consciousness, is brought into relation through Biology with the positive sciences that deal with objective fact, and is, in its own measure, amenable to the recognised conditions of scientific procedure. Now this renders necessary, as a preliminary to psychological study, some course of scientific training. Certainly, as Mr. Stewart urges, the student should not be left to learn from the statement of psychologists what Science is (or is not). But I would add, neither should the student be allowed to take up Philosophy or Psychology without something more than what Mr. Stewart seems to think may serve instead of scientific training—some " ordinary experience of the kind of evidence required by practical men of culture for alleged facts and events". That means, I suppose, either that the study should be deferred till men have been about in the world, or that an acquaintance with good literature will afford the necessary experience. The one supposition amounts to an exclusion of philosophical study from the academic course altogether; the other is based on what seems to me the mistaken conception of

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is when its cultivators are moved to essay all kinds of special investigations, and recognise clearly the practical bearing of its principles. In proportion as this journal is made the vehicle of publication for researches into the special phases of mental life, will it prove the scientific character of Psychology, and so fulfil the prime object of its institution. Or, again, in proportion as English psychologists trust themselves to give direction to the educators of youth, will it appear whether those "Laws of Association" which they have put forward as determining all natural development of consciousness and more particularly all intellectual synthesis, are truly the ultimate scientific principles they suppose.

Philosophy that pervades Mr. Stewart's paper. The truest friend of philosophical study, at the present day, will, I think, be the most anxious to contend for a preliminary basis of properly scientific culture. If Philosophy may be understood as rational interpretation of the universe in relation to man, it is of the utmost importance that philosophic thinking should work upon that knowledge which is surest—and this is Science. To say this is not to exclude Literature and History from the philosopher's preparation. The true nature of man is not to be learnt apart from the record of human actions in History and the expression of human sentiments and opinions in Literature. But the key to the philosophic interpretation even of Literature and History (their *enjoyment* is another matter) is to be found in the scientific habit of mind, and this can be gained only by a study of the special or positive sciences. While, therefore, I contend for beginning a philosophical course with Psychology in the interest of definiteness and with a view to unanimity, I assume that Psychology—so special or complex if it is viewed (in its place after Biology) as an objective science, so unique and hard to grasp if it is viewed as the science of subjective experience—will not itself be the first scientific doctrine to which the student is introduced. If it be, the very advantage sought for in making it the first stage of a philosophical discipline is rendered impossible. If, on the other hand, it is itself regarded as the natural term of a general scientific training, the dire effects fancied by Mr. Stewart are in no way to be feared, even though it were true that psychological results could be made no more definite than he finds them.

The case for Psychology is in truth extremely plain and simple. In Philosophy we are going to consider what may be said more or less determinately concerning the whole frame of things and man's relation thereto ; and we can proceed in either of two ways. We may begin in haphazard fashion, looking at the universe of being from this particular side or that, according to the fancy and temperament of the thinker. Or we may be guided by the thought that well-ascertained knowledge, to which we give the name of Science, has become possible under certain conditions of purely phenomenal consideration, and, as it is clear that our mental life in its various phases must contain an expression for all that is known, felt, or aimed at in relation to the world of being, we may seek to come at our ultimate comprehension of this through the most strictly scientific consideration that may be attainable of the facts and laws of mind as it appears. This psychological science is not in itself Philosophy, but there is no philosophical question whatever that has not its roots in some fact or facts of mental experience, and, however difficult it may be, men can, if they try, come to something like agreement here, and may then be impelled towards the same philosophical conclusions beyond. This is the great and fruitful idea that has inspired all characteristically British thinking for more than two centuries past, and it has been a truly philosophical conception even in those cases where the thinker has sought to merge everything in mere Psychology, and failed to mark where he crossed the borderline. It has preserved English philosophers from many a pitfall that has received less wary thinkers, and, as it arose in Locke and others from their having regard to the first great achievements of modern science, so in these latter days, when the natural sciences have had, as it were, a new birth, it has gained widely upon men's minds, and become the dominant conception in Philosophy.

If Psychology (with due preparation) is taken first in a philosophical course, Logic will naturally follow next. Should the formal doctrine, as Mr. Stewart suggests, have entered into the school-work, so much will have been gained, but, if not communicated earlier, it can no longer be deferred. The importance of Logic as a preliminary to philosophical thinking is accurately described by Mr. Stewart; or it may be regarded as a constituent part of Philosophy. There is not a more intelligible, or, when fairly understood, a more satisfactory definition of Logic than to view it as the doctrine *regulative* of thinking (or general knowledge) with a view to truth. From this point of view, its relation to Psychology and also its distinctive character are at once clearly seen. For the regulation of thinking it is necessary to understand how thinking naturally proceeds; at the same time, psychological insight does not of itself supply regulation. Regulation is a practical requirement, not a simply theoretic or scientific conception, and as applied to a phase of mental life corresponds with the strict notion of Philosophy. Logic, in relation to Psychology, may therefore be regarded as a department of Philosophy,—and this entirely without prejudice to another view according to which it may be taken as the most general of the abstract sciences, more general (in the sense that it deals with wider and simpler *objective* relations) than Mathematics, as Mathematics is more general than Physics. The conditions of Truth or true knowledge—Science as opposed to Opinion—being the concern of Logic viewed as a philosophical discipline, the discipline must be not less wide than are the varieties of truth. There is truth, as we say, to one's self and truth of fact, or (otherwise expressed) truth of consistency and real or objective truth. Formal Logic determines the condition of self-consistency, and is very properly taken first, because the prime concern with all of us, born as we are into the social state, is to work out more or less fully the meaning of the general assertions communicated to us that make far the greatest part of all we call our knowledge, and to apply general rules of practical conduct which it was never left to each of us to devise. But it is quite necessary to follow up Formal Logic with that other doctrine of Applied or Material Logic (or however else it is called) to which Mr. Stewart so pointedly refers. The study of such books as Mill's *Logic*, or Prof. Jevons's *Principles of Science*, in their methodological parts, may have little meaning for minds that know nothing of the special sciences; but students who have even a small acquaintance with scientific facts are very profitably led to consider the principles of evidence upon which they are received with a confidence varying in different kinds of matter, since the very same principles are involved in all the *real* inferences drawn in common life. At the same time it may be readily granted that to catch the true scientific spirit it is necessary to follow a master like Mr. Darwin at his work, be it coral-reefs or carnivorous plants that he is for the time investigating with an almost unconscious perfection of method; though the real appreciation of what in him has become art is greatly helped by foregone express study of Methodology. The class of inquiries coming under the head of Theory of Knowledge, it should also be added, falls to be introduced at this stage. The most scientific part of Philosophy proper is naturally associated with the logical determination of the conditions of Science.

On the same level with Logic and in a similar relation to Psychology stands Ethics. The student is not fit to enter upon this department of philosophical discipline without such preliminary training as has here been sketched, but with such training I do not see in what respect—as, for example, want of as much knowledge of the world as he may afterwards acquire—he is now unfit to be introduced to it. Now or at any time, however, he ought, in my opinion, to be introduced to ethical questions, not upon any interest he may happen to feel or be induced to feel in a particular work, whether of Aristotle or another, but definitely in relation to the original start in Psychology. Human action needs to be regulated as well as simply accounted for, and the philosophical theory of its regulation is Ethics, but for this it first needs to be explained in its natural manifestations. In a complete philosophical course, the student would also have presented to him the theory of the regulation of Feeling as far as this has yet been worked out, on a psychological basis, in Æsthetics.

What remains, as it seems to me, is that at this stage and not before—at all events not before Psychology has been followed up by Logic in its broader interpretation—the study of History of Philosophy should be seriously taken in hand. And I do not hesitate to say, with all the fear of Mr. Stewart upon me, that the study should in the first instance be made quite comprehensive and general, and that only afterwards should come that special occupation with this thinker or the other which with Mr. Stewart is the beginning and end of philosophical discipline. I would add too—what has been already remarked in another connexion—that when it comes to this it is no matter of indifference who the thinker is that should thus be assimilated into the student's mind. As we have to think nowadays in reference to a quite different experience from that of two or three, not to say twenty or more, centuries ago, it behoves the student to begin his *special* study of philosophers with a master not too far removed. The English student, supposing him to have become moderately familiar with the recent work of his own countrymen at the earlier or more positive stages of his philosophical course, cannot procure himself at once so much elevation of view and so much serious discipline in regard to the intellectual needs of the present time as by a thorough study of Kant at first hand. What knowledge of previous speculation is necessary for the understanding of Kant will have been obtained in the course of that general view of the development of philosophical thinking which is here supposed to have gone before.

The reason for studying Philosophy proper in its History is not far to seek. Even Science cannot be intelligently laid hold of without some notion of the way along which the present state of knowledge has been reached. Much more will it be an aid to philosophical insight to mark the past phases of speculation. Though there is no greater error than to suppose that there has been no movement in philosophical thinking or that there has been movement but no progress, it is not to be thought that a serious philosophical doctrine that fully satisfied the human mind at any stage of its development, can be discounted like the first rude representation of fact in early Science, or that it retains a purely antiquarian interest only. As Philosophy, though also a representation of a certain kind of fact, is essentially a representation that keeps terms with human feeling and human aspiration—is, in point of fact, *subjectively* determined—we are to expect in this department of human conceiving a certain recurrence of typical modes of interpretation that can never lose their value for different classes of minds, and thus an amount of guidance from the historical past which is not to be expected elsewhere. Nor, for my part, do I see how Philosophy proper (or Metaphysic in its stricter sense) can profitably be conveyed to students except in the critico-historical fashion. Even if a teacher, in these critical rather than constructive days, seeks to expound *his* ultimate view of things to a class of students, it is to them but one other added to the tale of historical systems, and the chances, in any particular case, are against the supposition of its being of equal value with the greater philosophical constructions that have weathered the storms of time. As the crown of a philosophical education, students are to be taught to think for themselves; and to this end there seems no other way but that of bringing before them a representation of the thinking of the best minds of the race. On this vital point there is no difference between Mr. Stewart and me. I object only to the arbitrary way in which he seems to shut up the student to converse with this single thinker or that, whereas I would give the student, after due preparation, the free choice of all. And as a last word I repeat *after due preparation*—scientific and other.

EDITOR.

VI.—CRITICAL NOTICES.

Der Operationskreis des Logikkalkuls. Von Dr. ERNST SCHRÖDER, ordentlichem Professor der Mathematik an der Polytechnischen Schule in Karlsruhe. Leipzig: Teubner, 1877.

This tractate, of only 37 pages, contains the clearest and most elegant exposition yet given of the mathematical or algebraic doctrine of logical reasoning. In essentials the author agrees with Boole, and his work may be regarded as in many points a simplification, in some points a rectification, of the elaborate processes first fully stated in the *Laws of Thought.* To Boole's method Schröder objects that the several steps in the symbolical processes are not in themselves interpretable or intelligible, and that certain elements are introduced and employed which cannot but be regarded as altogether foreign to the nature of logical inference. In place of Boole's algebraic method, he would therefore substitute forms capable of symbolic statement and subject to definite symbolic laws, but deduced carefully from the nature of the quantities symbolised, and at each stage intuitively interpretable.

Schröder, like Boole and all who have adopted the quasi-mathematical view of logical processes, starts from the consideration of classes as the elements of reasoning. Classes of things are the only logical quantities and the laws of symbolic operation are immediate expressions for the various relations of classes to one another. In this mode of restricting attention to the quantitative relations of classes, Schröder agrees in the main with R. Grassmann, to whom he refers, and to whom some of the theorems in the work are due. Grassman's *Begriffslehre oder Logik*, the second part of a more comprehensive treatise on quantitative reasoning in general (*Die Formenlehre oder Mathematik*), deserves attention. He appears to have written in ignorance of any previous attempts at symbolical representation of reasoning, and it can hardly be said that he has worked out his principles to their full extent. Most of the theorems stated in the *Logik* with considerable display of mathematical proof, are merely translations into symbols of the ordinary logical laws of relation between notions in extent. When the same quantitative method is applied to content, the results are not generally of much value. Grassmann expounds no general theorem of elimination which can be made of service in the solution of complicated problems, and though he has handled syllogism, the results are not of the first importance.

Taking as the foundation for his logical calculus the view of symbols as representing classes, the symbolic laws and processes are with Schröder dependent on the nature of class relations. In section first, the specifically logical processes are stated as four in number: two direct—Multiplication or Determination, and Addition or Collection; two indirect or inverse—Division or Abstraction, and Subtraction or Exception. The inverse processes however may be superseded through the operation of a fifth process, Opposition or Negation. In section second, the longest of the four, the principles of the calculus, so far as the direct processes are concerned, are stated with the needful definitions, postulates and axioms. The explanations of symbolic Addition $(a + b)$ and Multiplication (ab), together with the proofs of the cumulative $(ab = ba;\ a + b = b + a)$ and associative $[a(bc) = ab(c);\ a + (b + c) = (a + b) + c]$ laws of these two processes do not essentially differ from those of Boole. On page 12, however, is given a theorem which is not directly used by Boole; the omission, indeed, is one of the peculiarities of Boole's system. It is an evident deduction from the relation of super- and sub-ordinate notions, and may be stated symbolically thus: $a = a + ab$.

The introduction of the negative of any term leads to a statement of the useful principle that of one and the same class-symbol or of equivalent class-symbols the complements are equivalent, complement being that class-symbol which added to any other gives the result 1 or the universe of thinkable things, or which multiplied into the other gives the result 0 or the non-existent. It follows that of each term there is only one negative; thus $a + a_1 = 1$; $aa_1 = 0$.

Theorem 14 (p. 14) is substantially Boole's formula for the development of any logical function, but it receives a somewhat different statement, thus: "Any class b can be expressed in a linear homogeneous manner with regard to any other class a in the form $b = xa + ya_1$," x and y being indeterminate class-symbols which may have the values 0 or 1. The proof given is elegant; and a useful form of equation, $b=(ab+ua_1)a+(a_1b+va)a_1$, is deduced from it.

Theorem 15 gives a very simple explanation of the rule for multiplying developments according to the same arguments. The result of the multiplication is found by multiplying the coefficients of the similar terms.

Theorems 17 to 20 are the most original in Schröder's work. In 17 it is shown that any logical equation $a=b$ is capable of being resolved into the form

$$ab_1+a_1b=0\ ;\ ab+a_1b_1=1\ ;\ (a+b_1)\ (a_1+b)=1.$$

By this theorem he is able to dispense with the process of transposition, which can only be employed under definite conditions.

In resolving these equations the negatives of complex terms are constantly involved. Theorems 18 and 19 contain methods for finding these negatives. "The negative of a product is the sum of the negatives of the factors," $(ab)_1=a_1+b_1$; "the negative of a sum is the product of the negatives of the members," $(a+b)_1=a_1b_1$. Similarly the negative of a developed term is found by substituting for *all* the coefficients their negatives; thus $(ab_1+a_1b)_1=ab+a_1b_1$; for the first member may be regarded as completely developed with regard to *one* of the quantities, though it is not developed with regard to both.

These propositions lead to the fundamental theorem of Elimination and by simplifying this process they render superfluous much of the algebraic machinery introduced by Boole. Theorem 20 is thus stated: "The equation $xa+ya_1=0$ is equivalent to the two equations $xy=0$ and $a=ux_1+y$, u being an arbitrary class." Since $u+y=u(y_1+y)+y=uy_1+uy+y=uy_1+y$, and since, if $xy=0$, $x_1y=y$, the second equation may be written in the forms $a=(u+y)x_1$, or $a=u(y_1+y)x_1$, or $a=ux_1y_1+y$.

The inspection of this theorem shows us that by its means we can eliminate any given term from any equation ($xy=0$ being the result of eliminating a) of the given form, *i.e.*, since by theorem 17 any equation can be thrown into this form, we can eliminate any term from any logical equation. In the same manner we can state any logical quantity in terms of all the others involved in the original equation. The close relation between this method of elimination and that stated by Boole does not require to be pointed out.

The third section of the work applies the method to one of the more complicated examples solved by Boole. The superiority in logical intelligibility of Schröder's solution must be admitted; its superiority in brevity is not so clear.

Section fourth takes up the inverse processes of Subtraction and Division, shows how these are capable of being brought under the same forms of solution as have been expounded for Addition and Multiplication, and points out the peculiar condition, that of disjunctive relation between the terms, necessary for applying them.

As has been said the peculiar merit of Schröder's method is the closeness with which it keeps to the logical realities expressed in mathematical symbols. It is thus in every sense of the word a *logical* calculus; no law or process is admitted which has not a logical significance, and there is no step taken which is not susceptible of interpretation in logical language. Thus it approaches more closely to Prof. Jevons's method of indirect inference than to Boole's algebraic forms, and it enables us to perceive with more clearness than was possible in the case of Boole's logic, the worth of the symbolic representation of reasoning. Apart from any opinion as to the nature of the judgment, and therefore without pronouncing upon the philosophic validity of the doctrine that all logical quantities are classes, we must admit that after the preliminary process of throwing the premisses into quantitative form has been gone through, the symbolic method allows us to deal easily and compendiously with highly complex and involved reasonings. If we represent notions by symbols and their relations by algebraic signs, and if by introducing contradictory terms we can state exhaustively possible alternatives, then we can avoid the confusion incident to carrying the whole signification of our notions through the train of reasoning. But there is no more generality in the symbolic laws and processes than in the logical laws and processes which they express. We have in no sense brought logic under a more general quantitative science, as at first sight appeared to be the case with Boole's method. Even the process of elimination, which in Boole was effected by devices only dimly recognisable as logical, is in Schröder's system nothing but a complex application of the ordinary formal rules of logical inference. It is a convenient mechanical contrivance, founded on logical forms, and capable of translation into them.

A competent review of these various attempts to simplify logical processes by the use of algebraic symbols is a desideratum in logical literature.

R. ADAMSON.

De la Conscience en Psychologie et en Morale. Par FRANCISQUE BOUILLIER. Paris: Germer Baillière. 1872.

The word Consciousness, according to M. Bouillier, has many significations, but is to be used as expressing "simple, spontaneous consciousness, embracing all internal phenomena and all mental states"—as the primitive fact of the intellectual and moral life, the condition, the essence even, of every idea and of every feeling. It is not definable; its omnipresence renders circumscription impossible.

The beginnings of consciousness are slow and gradual. The first sensation is a vague impression of easiness or uneasiness, followed immediately by, if not contemporaneous with, the faintest perception of resistance on the part of the bodily organs or of a foreign body. The beginning of consciousness coincides with the beginning of existence; the moment of conception is also the moment of the first consciousness. This is the boldest hypothesis but also the best and most philosophical. Maine de Biran is right when he says: "To live is to feel".

What is the place of consciousness in a theory of the human mind? Is it, or is it not, a special faculty? If consciousness is a special faculty it ought to be *conceivable* at least apart from any other faculty. But it is not so. No psychological analysis, however subtle, can make it appear that to think and to know that one thinks, to will or to feel and to know that one wills or feels, are not one and the same thing. Leibnitz and Kant, when they speak of "imperceptible perceptions" and "unconscious representations," are not, indeed, speaking with rigorous exactness, but they do not mean to identify themselves with those who hold that consciousness is a special faculty of the mind. They only mean, by these phrases, *facts on the threshold of consciousness*, but not outside it. Others, however, Schelling, Schopenhauer, Herbart, Hartmann, &c., hold that consciousness is an ordinary but not necessary accompaniment of mental operations. But this is not the case. All possible diminutions in the consciousness of such and such an idea or sensation are conceivable, provided these diminutions do not reach the extreme limit of zero—in which case nothing would remain to which the name of sensation or idea could be given without the most singular abuse of reasoning and language. There is no ground whatever for any distinction between consciousness and the phenomena of consciousness.

Again, if consciousness is a special faculty it ought to have its own object, its distinct domain. But there is no such object, and no such domain. All facts, known or felt, are facts of consciousness, but there are no facts which can be called peculiarly its own. Consciousness is not a new element added to other psychological elements to enlighten and complete them, to make them *facts* of consciousness; it is the generative and essential element of all the powers of the soul, of sensation and volition not less than of intelligence itself.

Consciousness is not, then, a special faculty. Far from being shut up, so to speak, in any one part of the soul, it is that which envelops it, that which contains all its phenomena and all its faculties. Far from representing only one class of phenomena and being only one special faculty, all phenomena and all faculties are but its transformations and modifications. Consciousness is not a part of the Ego, it *is* the Ego in its entirety—the stuff of which it is made. It is not only the connecting link, but the very essence, of the powers of the soul—the reality of realities, the fact of facts.

English psychology generally, looking at the soul from the outside, if we may so say, sees nothing but phenomena, relations, laws of association; it finds no *being*, no *faculties*, nothing but apparitions and trains of apparitions. For it is only *within* that the *reason* of these phenomena can be found, and the force which produces and governs them. But an appeal to consciousness itself brings out the fact that we *feel* this force within us, perceive it clearly, in its permanence and identity, through and over all the phenomena which pass and vanish incessantly.

If only phenomena are found in us, so much the more will nothing but phenomena be found in the outer world. If we have not seized a reality in ourselves, a being which *is* ourselves, how can induction lead to the apprehension of any reality whatever outside of us? Mill flatters himself that he has provided for everything, saved everything, by his wonder-working mechanism of the Association of Ideas, "permanent groups," the "permanent possibility" of sensations—as if these possibilities did not demand some permanent *reality* always capable of exciting them in us in the same manner and in the same circumstances. One sees very well how an Ego of simple phenomena can lead to nothing but a Non-Ego of mere appearances. But, looking within, we find that something more than phenomena is given us, something which is the ground of all phenomena; we are conscious, in short, of *being* one, identical, and essentially active—of force, life, thought. This is the direct testimony of consciousness itself; and those who expect to behold the true nature of the soul *outside* of this immediate testimony resemble the man who wished to be at the window to see himself passing in the street below.

But does consciousness reveal to us nothing but our own being? Have we, or have we not, an immediate perception of the external world; or rather, of something which is not us but which exists not less really than ourselves? Has consciousness anything whatever, or has induction, on the contrary, everything, to do with our knowledge of the world without us? The answer is: that which is immediately given us, that which cannot be separated from the feeling of ourselves, is the fact of a *reality which limits and circumscribes our own*; that which is the domain of experience is *the interpretation of the signs, images, sensations, by which this reality successively manifests itself.* At the very dawn of consciousness we have a perception of resistance, we feel the conflict of two forces, the rubbing of what is ourselves against something which is not us, which reduces us to our true dimensions—whatever may be the nature, and whatever the properties otherwise, of this Non-Ego. Such is the element of truth which lies in the Natural Realism of Hamilton, on the one hand, and the Idealism of Mill on the other.

One question only remains: In striking consciousness from the list of intellectual faculties do we efface it from the science of mind? By no means. If consciousness is to be erased from the list of the faculties of the soul it is not because it is nothing; it is, on the contrary, because it is everything. It is consciousness which perceives, wills, remembers, feels, &c.—always the same at bottom, but receiving different names according to the diversity of its operations and modifications. Therefore we are to place it above all the faculties, not as the first among them but as the one principle from which they all emanate—the centre whence they all radiate, or better still, the common essence of which they are only modifications, varying under the influence of the activities within and the impressions from without.

The second part of M. Bouillier's book is an interesting discussion of the moral progress of the race, but is more literary than philosophic, and therefore less demanding exposition here. A word of criticism upon the portion now summarised. The author does well to insist upon regarding consciousness as the true life-stuff, the reality of realities, the one permanent fact in the midst of ever-varying phenomena, *Being* firm and sure—in opposition to all those who talk loosely of "trains of ideas" and "streams of consciousness" without establishing or even postulating any solid ground on which these trains may move, over which these streams may flow. But in his anxiety to establish this unity of existence as constituted by consciousness, it seems to me he has failed to perceive that the primitive act of consciousness which he himself adduces is not really simple but complex. The feeling of easiness or uneasiness, in which he recognises the germ of what afterwards becomes full-grown consciousness, is not a simple feeling: it involves at least a feeling of resistance, which again involves that of force—it also involves a consciousness of effort, which again involves that of will, however rudimentary: all this, at any rate, however much else. The passage of a living being out of absolute unconsciousness into consciousness, M. Bouillier rightly regards as inconceivable; but it is scarcely less so than his own theory of the growth of this highly complex being of ours out of that mathematical point of feeling which he assigns as the root of the whole. And so with that knowledge of the external world which, according to our author, is given by immediate perception: it is much greater than that which he concedes. The consciousness of something which limits and circumscribes me involves also the perception of movement, force, and all the essential qualities of matter. On no basis less solid and broad than this could we have constructed, however gradually, the whole edifice of the outer world as we feel it and see it now. The truth is, the ultimate fact given in and by consciousness is not a simple unity—the unity of a unit, so to speak—but the steady action and re-action of two ever-present realities, an indivisible duality of self and not-self, each under its twofold aspect of subject and object. That this conception is not foreign to M. Bouillier's mind, as it certainly need not be to his philosophy, there are more passages than one in this little book which go to prove. In any case, his work merits the attention of psychologists both on account of the questions it raises and the manner in which they are treated.

ALEXANDER MAIN.

Du Plaisir et de la Douleur. Par FRANCISQUE BOUILLIER. Paris: Hachette, 1877.

Here the author's first care is to mark the equivoques which even yet disturb psychological language, and keep up the confusion of two orders of phenomena so profoundly different as *representative* and *affective* facts. Eliminating every representative element he defines sensibility as *the power of experiencing pleasure and pain.* We cut off, he says, from sensibility all that belongs to the body, all ideas, even the humblest and most confused, and all determinations of the will, and leave, as its share, only pleasure and pain. These cannot be defined; they are only as we feel them, and all definitions are but repetitions of the words to be defined. There is pleasure whenever the activity of any living being is exercised in accordance with its nature—*i.e.*, in accordance with the preservation and development of its life; there is pain as often as this activity is turned aside from its end and hindered by any obstacle either from within or from without. M. Léon Dumont's theory, that pleasure depends upon an *increase* of vital energy and pain on a *diminution*, goes right in the teeth of experience. Existence itself is only possible on condition that there be *both* increase and diminution. The normal activity, then, unchecked, the evolution of the being according to its law, or this same activity hindered and thwarted, is the one cause, rule, and measure of all pleasures and of all pains. Pleasure is the free play of all the springs of life.

The primary pleasure is the love of life, the primary inclination is the tendency to persevere in being. All pleasures, as well as all pains, whether organic, or moral, or intellectual, spring from the movement of this essential activity towards its end.

There are no purely *passive* pleasures. Whenever we analyse the so-called charms of idleness, of repose, of reverie, we always find that it is not idleness which really pleases, but an activity or occupation *to our mind*, proportioned to our taste and our strength. The idleness which charms is always, strictly speaking, work more or less attractive. Voltaire is right, when he says, "Man is born for action . . . Not to be occupied, and not to exist, are for him the same thing."

There is pleasure even in pain; the chief cause of which lies in the increase, the extraordinary excitation, of activity, in the little shocks which are given to our entire being by the feeling of our own pains or the tragic spectacles which present themselves to our eyes.

In the same way are to be explained the pleasures of *sympathy*, which, at first sight, would seem, because of their character of disinterestedness, to owe their origin to something else than our personal activity and the love of our own being. But the love of our own being comprehends all that reproduces the image of it, all that seems to us as the outside-extension of it. What pleases or pains us in others is precisely what pleases or pains us in ourselves—the different changes, the free or impeded manifestations, the successes or reverses, of a spontaneous activity like our own, in its struggles with that which surrounds, encloses, clogs it. As the root of social morality is individual morality, so the root of sympathetic sensibility is personal sensibility.

Activity, the essence of the soul, is not subject to suspension or intermission: whenever we seek to surprise the soul we always perceive it either acting or re-acting, causing movement and life, or thought and will. There is, therefore, no state of indifference for a conscious being; sensibility is present at every moment of our existence; it is continuous, like the activity from which it emanates. Prof. Bain's doctrine of *states of neutral excitement* is self-contradictory. There are degrees of sensibility, but there is no absolute extinction of it. It is omnipresent, and continuous without a break. We live and move in the midst of it; our whole being is, so to speak, bathed in it.

But, strictly as pleasure and pain are related to each other, there is nevertheless an order of precedence between them; one of them is the primitive fact, the antecedent, the other is the consequent. The primitive fact is pleasure; pleasure precedes pain, as movement precedes hindrance and arrest. Of the two great modes of sensibility pleasure is the positive, pain the negative.

The *quantity* of pleasure is greater than that of pain; for, if pain is hindrance, arrest, destruction of life, how could it prevail over pleasure without the species ceasing to exist?

There are two possible modes of *classifying* the phenomena of sensibility: the one according to Intrinsic characters, the other according to Extrinsic. The latter is to be preferred. Classification to any purpose can only be made by marking the *causes* of pleasure and pain—the different energies of the soul on which they depend, the different modes of activity which are inseparable from the objects which excite them. There are four principal modes: Instinctive, Habitual, Intellectual, and Voluntary, activity. All other classifications, such as those of Hartley, Bentham, and others, are either too detailed or arbitrary.

Such is a very brief summary of a most interesting and able work. The least satisfactory part of the book is that in which the author offers his classification of the facts of sensibility. If pleasure depends upon the balanced activities of the living being, it follows that the *rank* of the various pleasures is to be determined by the intensity and variety of the forces which the individual is able to keep in free play. It remained for M. Bouillier, therefore, to point out the *objects* which have been found to call forth most readily this intensity of energy, and to set working most freely these various forces. This he has not done, the division he has himself made affording only the faintest suggestion of such a classification, if it does even that much. But he seems to me to have thoroughly secured his central position, that sensibility to pleasure and pain mingles with all our acts and envelops our entire being—is, in fact, one with consciousness itself. There is, however, other ground taken up in the course of his argument which must be regarded as much less tenable. For example, there is a tendency all through to consider sensibility as a real fact, a true something, *quite apart from all its objects*—an ultra-metaphysical tendency, in short, curiously running parallel with a decided bent towards modern views and the concrete treatment of philosophical questions. But surely the humblest fact or act involving conscious activity involves also a knowledge, however limited and dim, of something acted upon. The attempt to look upon the phenomena of pleasure and pain as purely subjective must prove a failure; the merest rudiment of sensibility implies a consciousness not only of a body but also of an external world in contact with it. And even M. Bouillier is forced to admit as much, practically at least, when he comes to classify the pleasures and pains: finding little help here in purely subjective considerations, he proceeds to arrange his phenomena according to the nature of the *objects* to which they stand related. But why should this be necessary if these phenomena are *boná-fide* facts *apart* from *all* objects? Were M. Bouillier to carry out his theory to its legitimate extent, with a full knowledge of all that the simplest act of consciousness includes, he would be led to apply his conception to all the *objective* elements inseparably linked to the most primitive facts of sensibility, and thus to ground the phenomena of pleasure and pain in the very nature of *things*, instead of confining them to the conscious activities of living beings—an extension which would make the theory philosophical in the highest sense, as embracing the facts of *all* existence instead of narrowing itself to a consideration of those only to which it has hitherto pleased most thinkers to attach the conceptions of consciousness and life. He and M. Dumont would then be at one in their last issues, although, in all other respects, the theory of the work before us will be found to cover the facts of experience most completely, and to be most coherent throughout.

Alexander Main.

Die Lehre Spinoza's. Von Theodor Camerer. Stuttgart: Cotta, 1877. Pp. 300.

This is an exposition of Spinoza's thought in its matured and final form, that is, an analysis of the *Ethica* merely, leaving untouched the dark but interesting problem of the origins and growth of the great philosopher's system—a problem to which it is to be hoped the author will now apply himself. And it is an exposition merely, the author avowedly restricting himself to just so much of criticism as is necessary for a thorough characterisation of the doctrines under examination. It is perhaps the most thorough and penetrating analysis of Spinoza's system ever written. Much of the exposition is of course debarred from any claim to newness; but, even when on well-trodden ground, the thorough grasp of his subject and careful statement that the author everywhere maintains would suffice to make his work useful; whilst in not a few instances we find a new light cast upon dark places. The chief novelty is in the treatment of the "*essentiæ*" and the "two divine causalities". Props. 21 to 23 of *Eth.* I. deal with an "infinite divine causality," whose object is "infinite *modi*"; whilst Prop. 28 deals with a "finite divine causality," whose object is "finite *modi*". Camerer shows very instructively that amongst the infinite *modi* we have to place the *essentiæ rerum*, the essences, or *Wesenheiten*, of things. Throughout his exposition of Spinoza's ontology, of his doctrine of cognition, of his theory of the passions, and of his ethics proper, Camerer never loses sight of this principle, that the *essentiæ* of things are infinite *modi*—a method of exposition which seems to articulate the system more closely than it has ever been articulated before; whilst in some cases, as in the treatment of *Eth.* V., 23, it affords standing-ground for a new point of view. The ground is now quite cut from beneath the feet of those critics, of superior penetration, who would like to make us believe that they have here caught Spinoza in the uncandid act of setting up a merely specious immortality of the soul. The "*aliquid æternum*" that survives the body is the "*essentiæ*" that we meet with on the very threshold of the *Ethica;* it is an inherent and indispensable part of the system. Moreover, not only does this essence of the man survive the destruction of the body: it remains self-conscious too—with a self-consciousness that is personal and individual; (and this for more reasons than one, for which we must refer the reader to pp. 121 to 123 of Camerer's essay). The *Ethica* may, and does, contain obscurities and inconsistencies and faulty reasoning, but from the beginning to the end it certainly does not contain an uncandid word.

As regards criticism, Camerer's exposition gives, of itself, the following chief results:—(1) The Unity of the Attributes in the Substance, and the consequent relations of the products of the different Attributes, are not thinkable in the manner in which Spinoza requires us to think them. (2) The Unity of "the two divine causalities"—infinite and finite—and of their products, is not demonstrated, and the relations of the Infinite and Finite in the world remain a mystery. (3) The relation of the Personal to the Universal, of the individual to the species, remains obscure. Though not possessing the point and brilliancy of style of Kuno Fischer's essay, Camerer's style is clear and precise; his book is a most thorough piece of work, and cannot be too warmly recommended to all who care to understand Spinoza perfectly.

ARTHUR BOLLES LEE.

VII.—REPORTS.

Detection of Colour-Blindness.—A little work by Dr. J. Stilling, *Die Prüfung des Farbensinnes beim Eisenbahn- und Marinepersonal* (Cassel, Fischer, 1877), though published for a purely practical purpose, to test the Colour-Sense of railway servants and pilots, and so avert the danger which arises from mistakes with reference to signals, has still considerable interest for all psychological students whose investigation lead them into the region of analytical inquiry on actual sense-perceptions. It consists of a few pages of letterpress, in German and English (the latter not always very intelligible), accompanying three chromo-lithographic plates, which form the real *raison d'être* of the publication. The plates are extremely ingenious, and admirably adapted for the purpose which they are intended to serve. The first contains four rectangular figures, made up of small chequered squares, in alternate shades of light and dark green; amongst which a few dull red squares are arranged in the form of certain alphabetical letters, printed in exactly equivalent shades, so as to be quite indiscriminable by any difference save that of colour. Had the letters been simply lithographed on a uniform green gronnd, the overlapping of pigment and the variation of light and shade might have afforded a clue by which the colour-blind subject could decipher the figures. But the device of definite squares, enclosed by thin black lines, deprives the observer of all such aid, and throws him back upon the pure colour-perception of red and green. The second plate contains similar figures in brown and red; while the third rings the changes upon certain arbitrary symmetrical shapes, so as to supply a device for testing children or adults who cannot read. These tables are useful only for the detection of red-green colour blindness. Another set, sold separately, affords like means for discovering the existence of that rarer abnormality, blue-yellow colour-blindness. It is much to be desired that a few competent psychologists should use these plates for a series of careful observations, noting the results numerically. The currently accepted statistics as to colour-blindness are by no means free from doubt; and many useful experiments might be tried on young children, very illiterate rustics, and inhabitants of various outlying parts of Britain, such as Cornwall, Wales, the Highlands, and Connemara. But this is a work which of course demands co-operation. At the present moment, when so much interest is felt in the question of primitive colour-perception, might not the Anthropological Institute do something to promote or suggest the employment of these or similar tests by travellers amongst low-type savages? We are still sadly ignorant with regard to the actual sense-perceptions of the human race generally, and a little inquiry in this direction on the part of those who have the opportunity, might throw much fresh light on many disputed questions.

G. A.

A contribution to the Theory of Sleep.—Dr. A. Strümpell communicates to *Pflüger's Archiv* XV., p. 573, the following short note :—

"In the autumn of 1876 a lad of sixteen was admitted into the clinical ward at Leipsic, in whom a number of sense-disturbances became gradually developed to an extent that is very rarely observed. The skin over the whole body was in every respect perfectly insensible. The strongest electric currents, or a burning taper held to the skin, could not excite pain or any kind of tactile sensation. A like insensibility was shown by almost all the accessible mucous membranes of the body. The sensations comprised under the name of 'muscular feeling' were also entirely wanting. The patient, when his eyes were shut, could be carried about the room, and his limbs could be placed in the most uncomfortable positions, without his knowing anything about it. Even the feeling of muscular fatigue was lost. There was also complete loss of taste and smell, with amaurosis of the left eye, and deafness of the right ear.

"In short here was an individual *possessing only two channels of communication with the outer world—the right eye and the left ear.* These two last channels could also at any time be easily closed, and thus the *effects of completely isolating the brain from all external sensible stimuli could be observed.*

"I have frequently made the following experiment, and often showed it to others, *always* with the same result. The patient's seeing eye being bandaged and his hearing ear stopped, after a few (generally two or three) minutes the expressions of surprise and the uneasy movements at first excited would die away, his breathing would become quiet and regular, and he would be *fast asleep.* The possibility was thus realised of sending one artificially to sleep, merely by withholding from the brain all stimulation through the senses.

"The awaking of the patient was as interesting as his going to sleep. He could be roused only by some auditory stimulation, as a shout into his hearing ear, or by letting light fall upon his seeing eye: no pulling or shaking had any effect upon him. When left alone, he would wake 'of himself' in the course of the day—only after a sleep of many hours—either through some 'internal stimulation' or (as the brain gradually became more excitable) through slight external stimuli that could not be kept from acting upon the senses still remaining to him."

Dr. Strümpell promises to give elsewhere a circumstantial account of this most interesting case, and the observations it suggests are better deferred till the fuller information is supplied. The present short note was furnished at the request of Prof. Pflüger, to whose view of sleep (*Archiv* X. 468; see MIND I. 134) it lends support.

Teleological Mechanics of Life.—Professor Pflüger of Bonn has recently published in his *Archiv* (XV. 57) a memoir under the above title, continuing the series of wider speculations for which he has long been distinguished among physiologists. One noteworthy feature of the memoir is the repeated reference which the author makes to the biological doctrines of Aristotle as embodying ideas of permanent scientific value. The paper also contains, among the illustrations or evidence bearing on its main thesis, some suggestions of independent worth on particular questions of physiological psychology.

With regard to the vital processes in general, Pflüger starts from the position that, as a rule, only those combinations of "causes" are realised that are most favourable to the animal's welfare, and he proceeds first to consider the general phenomena of mind and instinct as exhibited by the lower animals and men. Consciousness of some sort, however obscure, must be ascribed to the lower animals when it is seen how in them, as well as in men, action varies with circumstances for the greatest possible benefit of the system. Whether every cell in the body has its beneficial or purposive (and therefore rational) work guided by some faint glimmer—as the work of the ganglion-cells of the central nervous system proceeds in the full light—of consciousness, is a question not to be answered. But at all events there is no need to assume (as Aristotle did) a *psyche* as the immediate cause of the vital phenomena, if all purposive acts of the system can be referred to "an absolute mechanics". Indeed, it will then rather become a question whether "the conscious *psyche*" itself is not a natural phenomenon analogous to the "rational" work of all vital organs. As a matter of fact many processes go on in the central nervous system which, while either unknown to the ego, or at any rate performed without foresight and calculation, have yet as their direct and necessary result conscious perceptions and volitions which the wisest reflection could not make more effective for their ends. Such are the so-called instincts of animals. According to Pflüger, "a rational instinctive act is willed by the conscious ego, but not motived or induced by foregone conscious reflection," and the selective action which astonishes us so much in the apparent actions of animals would, he thinks, if we had more exact knowledge of the relations of atoms and molecules in the living cell, be found everywhere in the organism. As one remarkable example of instinct observed by himself, he mentions the case of a young turkey hen which, though never fertilised, laid sixteen eggs, and then beginning to brood went on sitting steadily on her nest, or if forcibly removed returned passionately to it for weeks after all the eggs had gradually been taken away. Here the instinctive act of brooding was not only consciously willed, but vehemently maintained, though the proper aim of the act was frustrated from the first, and at last (by removal of the eggs) was no longer present to consciousness. So in like manner, continues Pflüger, in man too there arise thoughts and wishes that result in the most rational and really purposive acts, while yet the true ends are not the motives present to consciousness. Changes of diet with the seasons, changes of occupation, the shrinking (with dizziness) from precipitous places, the aversion to contact with the dead or diseased or to creeping things, the shivering from cold, the craving for light, the curious scanning of new objects and surroundings—are some of the instinctive acts in man occasioned by present feeling, but having for their real ground the self-conservation of the individual. Other instincts subserve the continuance or improvement of the species, such as personal adornment with reference to the sensibilities of the other sex, the sense of shame (found also in lower animals) involving selective choice of partners, dislike of deformed individuals, &c. The new-born child sucks by an instinct, *i.e.*, voluntarily and with pleasure, not as a reflex-machine (which is the common physiological opinion). Maternal love is another instinct; and indeed, from birth to death man (as well as the lower animals) is far more dependent on instincts than is commonly supposed. All of them, as introspection shows, proceed from some internal or external excitation of the senses, with which are joined images and dispositions that determine the will according as they are agreeable or the reverse. When there is no past experience that can be subjectively revived, as in the first flight of the butterfly, we must suppose a motor impulse determined by muscular feeling—a volitional energy of definite quality followed by definite movements, like the impulse to stretch the limbs on awaking from sleep. There is of course no intention in the insect to fly or in the suckling to drink—only a determinate impulse, with a feeling of pain till the ego re-acts in a determinate way. The effects of the particular acts are matter of experience, but the "first voluntary acts" themselves are conditioned by the organisation in such manner as is necessary and advantageous for the animal's well-being.

After the lengthy excursus thus summarised—an excursus which contains many interesting observations, but which is not marked by much precision in the use of psychological terms—Pflüger proceeds to enunciate what he calls the 'Teleological Law of Causation,' implied in these actions of all the obscure forces:—*The cause of every want* *of a living being is also the cause of the satisfaction of the want.* By "cause of the want" he means any state supervening in an organism that must for the weal of the individual or species be transformed into another state. Within this supreme principle, he formulates two 'Laws of Teleological Mechanics'. These are:—(1) *When the want affects one particular organ only, this organ alone procures the satisfaction of it;* (2) *When the same want affects a number of organs at once, a single organ very often procures the satisfaction of it for all.*

In support of the first of these two laws, he refers to the movements of the iris necessary for regulating the amount of light on the retina: these are not determined (as might be expected) by the direct action of light on the cells surrounding the pupil, but are operated through the brain from the optic nerve itself whose interests are concerned, for when the optic nerve is blinded the movements do not occur. Again, the juices secreted by the alimentary canal are poured forth only on occasion, and in proportion to the amount, of the stimulus supplied by substances present in the canal. The bladder and rectum act only when full; the presence of semen determines the generative act. The living cell itself regulates the flow of oxygen to it; and expenditure of energy, as by a muscle, not only entails proportionate restoration but also gradual increase of the store. Extirpation of one of two related organs may be compensated by increased activity or even structural development of the other.

The second law is exemplified by the way in which the general want of nutrition in the frame is supplied through particular affection of the vagus nerve or its medullary centre, appearing in consciousness as the feeling of hunger; also the feeling of thirst, connected with only one nerve that suffers with all the other tissues from want of water, determines a general supply. The movements of respiration are another instance in point, not being determined by continuous periodic action of the respiratory centre in the medulla oblongata, but being accommodated to the extremely variable wants of the bodily system, in respect of the two distinct phases of the respiratory function—the taking-up of oxygen and the giving-off of carbonic acid: want of oxygen in the system excites the nerve-cells of the respiratory centre to increased activity, and excess of carbonic acid has also a stimulative effect, resulting in increased expiration.* But the most striking exemplification of the law is seen in the work done by the central nervous system for all other organs or the body generally. "Infinitely varied is its activity in relation to the wants of the individual. The conscious *psyche* itself seeks constantly, often in the most complicated ways, to secure the welfare of the Ego and bring about the most favourable conditions for the satisfaction of its wants." Instinct, as before urged, is in many cases a true guide, the mechanics of this regulation being relatively simple, as based on the principle of pleasure and pain; for, as a rule, all acts conservative of the individual or species are pleasurable, and the contrary ones painful, while the way to self-destruction is barred by the strong impulse of self-preservation even in states of hopeless misery. In man, however, the egoistic impulse, in the complex circumstances of human life, often determines a temporary sacrifice for a greater gain in the future, unlike the lower animals that are impelled always by the needs of the moment, except as they are guided by instinct. There is also the still higher human development attained by some individuals—of self-sacrifice for others : virtue then has cut itself wholly loose from its egoistic root so far as the individual's personality is concerned.

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* Pflüger here, in order to contest an opposed view of Hermann's as to the respiratory action, makes a long digression which possesses an independent interest. His object is to establish that whatever causes a sudden and considerable increase in the excitability of nervous matter, does also at the same time actually excite it. This, he says, is beyond question, because all living nervous matter is as a matter of fact constantly in a state of excitation. So-called repose of nerve is but a different degree of activity. There is always a faint ringing in the ears which may be heard in stillness if it is attended to. There is always a faint sensibility at any point of the tactile surface to which attention is directed, in the absence of all external stimulus. In the eyes, besides the so-called 'light-chaos' when the eyelids are shut, there is also the state of blackness, which, as Helmholtz maintains, is an actual sensation—being limited to the natural field of vision and not,

In conclusion, Pflüger seeks to give precision to his view of the animal mechanism by a comparison with the performance of a highly elaborate musical box. The various melodies may represent the various bodily processes in the animal necessary for satisfying incidental wants and meeting occasional disturbances, but the mechanism in the animal is such that the structural or functional change which brings on or constitutes the want touches (as it were) the knob that starts the melody proper for the occasion. However, disturbances may occur which there is nothing in the vital mechanism to meet, or an action may go forward in circumstances where it is unnecessary or even injurious. The work of the organism, in fact, shows a purposiveness that is by no means *absolute*, but present only under certain presuppositions ; and this stamps it as of a purely mechanical, and in no respect arbitrary, character. How the teleological mechanics, such as it is, arose is one of the hardest of questions. Empedocles supposed that numberless lumps of varied living matter were at first produced by nature and then perished, till at last some happened to arise that were capable of existing in the circumstances that were. But in strictness no living thing is capable of existence ; all perish inevitably sooner or later. Rather we must conceive as a necessary attribute of the *prima materia*, from which all life has proceeded, this—

for example, extended to the back of our bodies. Pflüger's own interpretation of black in relation to white is that they are true opposites (as commonly supposed), depending on different states of excitation in the sense-organ ; and in support of this view he forcibly urges the analogy of cold in relation to heat, nobody ever doubting that cold in itself is as much a sensation as heat is. There is indeed, as he says, more than a mere analogy between the two cases ; for the eye, according to the development-theory, is to be viewed as a modified piece of the skin, and it is the same physical agent that excites the sensation of temperature in the skin and of light in the eye.

that by virtue of the succession of its changes all in the end leading to death it could produce its like before passing away. The first living matter must have been able to take in nourishment, to grow, to propagate, and to act purposively in relation to its environment. The deepest lying problems of physiology are thus in fact given along with the primordial living matter. In an earlier memoir (X., p. 251 'On physiological Combustion in Living Organisms') Pflüger started an hypothesis as to the processes determining the creation of living things, which, he thinks, opens up at least the possibility of understanding how the greatest of all events in the world could have come to pass in harmony with the law of causation and all known experience.

Sensory Functions of the Spinal Cord.—The foregoing Report should interest all readers who are concerned in the question of Animal Automatism, discussed in the last number of this journal on occasion of Mr. Lewes's *Physical Basis of Mind.* The related question as to the presence of a sensory function proper in the lower nerve-centres, to which Mr. Lewes gives so much prominence, is also touched upon in Pflüger's memoir, and a short summary may here be given of his observations on a point which, in 1853, he was the first among recent physiologists to raise. He has not, he tells us in a note at p. 61 of his present memoir, where he uses the word "Brain" for the whole central nervous system, changed his original opinion as to the sensory functions of the spinal cord. Almost all physiologists are in error as regards the movements of headless or brainless animals. Self-observation alone can show what movements are reflex, *i.e.*, proceed without will, and what do not proceed without will. Every polyp shows an Ego divisible into a number of Egos, as a magnet may be broken up into a number of magnets. If the cerebrum were the only seat of psychical energy, how about the amphioxus that has nothing but a spinal cord? It may also be noted that in some fishes not only the fore brain but also lower portions of the central nervous system have a hemispherical development. If such lower animals are regarded as mere reflex-machines, then also human beings for weeks after birth must be pronounced equally mindless, for the human infant cannot till after some weeks perform even so simple an operation as scratching. The brain, it should be remembered, is developed along with the spinal cord, and consists, as far as we know, of absolutely the same elements. Nobody denies that the central nervous system is the seat of the psychical functions; but the cord is part of it. It has been proved that the nerves of the trunk have their central ends in the cord and not in the brain. Why then is the *psyche* to be supposed immediately connected with the brain and only mediately with these? Many judge the question on purely hypothetical assumptions as to the nature of the psychical process, though this is the greatest of riddles for which nobody has the least shadow of a solution. Some like Du Bois-Reymond would even put forward as scientifically established facts views that are certainly not proved—as if there were an end of controversy on the subject!

In the following number of the *Archiv* (XV. 149), Du Bois-Reymond repels this charge of having made light of Pflüger's objections to the Reflex Theory. In the only printed reference he ever made to the subject (*Leibnizische Gedanken in der neueren Naturwissenschaft*, 1871), his real intention was to represent Pflüger's assumption of sensory functions in the spinal cord as the express alternative to the notion of a pre-established harmony of reflex arrangements, supposed to account for the purposive movements of headless animals. And when he treats the subject in his lectures he is in the habit of closing in some such fashion as this: Either we must suppose the soul divisible, or that in the beginning God provided the frog with a reflex mechanism arranged for the occasion of a physiologist cutting off one of its feet and dropping vinegar upon the other. Du Bois-Reymond thinks he could not more strongly show the disputed condition of the question.

Pflüger accepts the correction, and goes on to elucidate farther his own position, in view of the ironical ascription often made to him of having discovered the "spinal cord soul". It is certain, he says, that particular conscious, *i.e.*, mental (*seelische*) states of varying intensity and quality succeed each other in us, and are only so long observed as the brain-matter is in normal condition and alive, that is to say, is normally nourished and respires. It is certain also that these states stand to the brain as vital process to organs. It is, on the other hand, a hypothesis, to ascribe them to an immaterial soul or spirit. "Soul" can only in strictness be used for the fact of conscious excitation in the central nervous system. Though consciousness has no means of investigating itself, any more than a hand can grasp itself, and thus far remains unexplained, it is not therefore outside the pale of the causal law of nature, without which there can be no scientific inquiry.

The real ground of the opposition to his view lies, Pflüger thinks, in its consequences. It undoubtedly implies that separated parts of the same central nervous system, so long as they remain alive, may be psychically excited apart from each other, or that consciousness is divisible. The fact is evident in the division of lower animals. How is such a result conceivable? "In any psychical nervous mass appearing as a continuous aggregate, the vibrations of all molecules are plainly accommodated to one another. This solidarity of dynamical equilibrium, this harmony of all integrant parts, is the foundation of the individuality and unity of consciousness."

The excitation of psychical matter—matter, that is to say, whose work is joined with consciousness—comes to pass thus. The cerebrum consists of the most unstable sort of living matter, which is constantly being decomposed with great rapidity by heat, while this dissociation takes place more slowly in the spinal cord, though more quickly there than in any other living matter. The brain thus constantly appears spontaneously active and propagating its excitations, which may be received from the sense-organs, to the other parts of the central nervous system, including the spinal cord. And the specific character of this central excitation is to be accompanied by consciousness.

The more the central nervous system is cut away from before backwards, the more torpid and sleepy one of the higher animals will become, and the less complex will be its external psychical acts, though always relatively rational in their character. An amphibian retaining only the spinal cord is sunk in a deep torpor. But every stimulation of the sensory nerves causes an excitation of the cord, which is forthwith, as in the brain, associated with consciousness. The cord is thus momentarily roused from its torpor and, however abnormal the circumstances may be made, reacts according to the principle of pleasure and pain in movements of the limbs that resemble voluntary movements as one egg resembles another. Pflüger therefore regards the movements as reactions of a sensitive being. The reasons that can be given are neither more nor less valid than for the ascription of mind to animals generally. In neither case is there absolute proof.

VIII.—NOTES AND DISCUSSIONS.

Presentative and Representative Cognitions.— Mr. Spencer's division of cognitions (into Presentative, Presentative-Representative, Representative, and Re-representative) when simplified, marks two general classes—Presentative and Representative. The facts that representation is so essential a factor in all our mental processes that practically there is no purely presentative cognition, and that presentative knowledge is found also in the midst of representation have together received illustration in a former paper ('Knowledge and Belief,' MIND No. VII). Yet to the end of showing their mutual relations and their significance in the elaboration of knowledge, it is desirable to note a little further the characteristics of each and the differences between the two.

Knowledge as a product consists of products or results of acts of cognition. What is termed a cognition is a preserved result of an act of cognising. Such a preserved result is only the original cognising act repeated with a difference of feeling which is also cognised (I do not here go outside of consciousness). Accordingly, a mental product elaborated and preserved is a representative cognising act, or, as we say, a representative cognition. It must then be observed that elaborated knowledge—as a product of knowing—consists wholly of representative cognitions, and that presentative knowledge cannot strictly be considered as in any sense a product. Products of knowing are cognitions stored up, so to speak, and the moment the producing becomes a product, it passes from the category of presentative to that of representative knowledge. A product is a *productum*—in a past tense. Indeed even in describing presentative knowledge we are in truth describing representative; for we are dependent upon our recollection for the accuracy of our descriptions, and recollection is the exhibition in the mind of representative cognitions. We are thus led up to the same tangle into which we are always brought when we attempt to solve the problem of memory. Reproduction is a reproduction of a past experience, and is hence apparently subordinate to an original present experience; and yet the knowledge that a representation is a representation seems to be equally ultimate and fundamental. But in full view of this difficulty it is nevertheless useful and probably indispensable to make a distinction between presentative and representative knowledge, thus forming two distinguishable though inseparable classes of cognitions. To avoid misconception, however, I repeat that what is termed presentative knowledge is after all an artificial class of representative knowledge, and that the former is not and by its very nature cannot be retained as a product while remaining presentative.

Presentative knowledge, or the presentative element in knowledge, is largely distinguished from the representative by its greater vividness. A thing which we see is more vivid than an idea of that thing. The idea is a copy fainter than the original impression. Sometimes the idea approaches the sensation so closely in the matter of vividness that the two are confounded, as in hallucinations of various sorts embraced under strong emotions; the man under the influence of fear thinks he sees a ghost, the drunkard beholds as realities, horrid, distressing phantoms. But as a rule presentative cognitions may be readily distinguished as such from the higher degree of vividness which the impression has to the mind.

Presentative cognitions are immediate, representative are mediate. We are said to know a thing immediately when we cognise it in itself; mediately, when we cognise it through something numerically different from itself. When one sees a book upon the table, the colour is immediately cognised: on the contrary when the mind has the thought or idea of a book, the book itself being absent, that thought or idea is immediately cognised; but the actual phenomenon of colour is mediately cognised through the idea. Immediate cognition involves the present fact of the existence of a thing; mediate cognition involves the belief in the past, present, or future existence of the thing.

Presentative cognitions are relatively more simple, and representative cognitions are relatively more complex. In the first place representative cognitions have a double character which presentative are without; for every representative cognition is also a presentative one when considered merely as a mental phenomenon. My remembrance of a house is a representative cognition, so far as it refers to the reality of a house known by me; in the degree that it is an idea of the mind it is presentative. In the second place presentative cognition gives no opportunity for the combination and recombination, the differentiation and integration, which is conspicuous in representative knowledge. When through the associating processes knowledge attains as a product great complexity, it is through representative rather than presentative cognition. The higher processes of abstraction, generalisation, comparison, reasoning, and the like, work out their results through representative and re-representative combinations.

In presentative cognitions the continuing present impression is the primary object of cognition; whatever there is of representation (and the latter is never absent) is secondary and subsidiary to the continuance of the present experience. In looking at a light, my remembrance of the light being present a moment ago is secondary to the present impression of the light and aids in connecting together the moments of continuance. On the other hand, in representative cognition, the primary object of cognition is the past impression; the present idea is secondary to the reality recalled. In remembering John Smith, the actual John as known by me in time past is the primary object of cognition; the present idea of John Smith is only accessory to the recognition of the past experience. So also in believing that something will occur in the future, the occurrence which will be actual is the main object of cognition, while the present idea of that occurrence is but an adjuvant thereto.

It has been already implied that prevailingly presentative cognitions are more original, and prevailingly representative more derivative. The meaning of the terms suggests this. It might then be said perhaps that presentative cognition is the absolutely original factor of knowledge and that representative cognition is wholly derivative. Yet so far as we can discover, no cognition at all is attainable without representation. We are thus forced to a contradiction; but it is only the contradiction to which we are always brought, if we attempt to pass out of the sphere of the relative. It is the same difficulty which arises in attempting to conceive of a beginning. We are all the time positing a beginning of things, but on reflection we are not able to understand how a beginning is possible; *ex nihilo nihil fit.* We say there must have been a point when arose the first item of knowledge; that item was a presentative and original cognition; but in order to any cognition or consciousness at all we find that there must be a representation of former cognition. We can only assert then that the mind makes a fundamental distinction between presentative knowing and representative knowing; that the terms are each necessary to and exclusive of the other; that in the products of knowing, some cognitions are more prevailingly presentative and some more prevailingly representative; that the former are relatively original, the latter relatively derivative.

Presentative cognitions may be either sensational or ideal, presentative cognitions being sensations cognised or ideas; representative cognitions are ideal only. It is probable, however, that this difference is one of degree rather than of kind; a sensation is a mental phenomenon, so also is an idea which is a faint repetition of the sensation. The antithesis, however, is useful in giving a more complete view of the difference between the two classes of cognitions now under review, though it conveys no information not conveyed by the terms presentative and representative.

There are no degrees of intensity in cognition; the intensity is a matter of feeling concomitant with cognition. The terms *vividness* and *faintness*, before made use of, depend for their meaning somewhat, if not entirely, on concurrent feeling, and for the subsistence of the phenomena marked by them feeling must of course be invoked. The terms *definiteness* and *clearness* (in the sense of definiteness) apply properly to cognition; a cognition may be definitely marked or may be indefinite according as it is sharply separated from some other cognition or blends insensibly with that other. In respect to definiteness and clearness, presentative knowledge is the superior, for representative knowledge carries with it a vast collection of partially integrated, ill-defined cognitions associated together into a mass whose parts are full of confused suggestion not easily bounded or confined. Some representative cognitions, however, of more simple character are definite, as the recollection, for instance, of a familiar face; likewise some presentative cognitions are very indefinite as the cognition of an organic feeling of discomfort; but on the whole the rule prevails as stated.

Inasmuch as knowledge is a growth from relative simplicity to complexity, the most natural division of cognitions is one based upon relative complexity; but since presentative and representative cognition are so inextricably involved with each other in fact, separating the two in classification is no easy matter. In truth, the separation must be somewhat arbitrary, and lines, if drawn at all, must be drawn with only an approximate correctness. Rough groupings may be made, however, of cognitions both presentative and representative according to the degree of their complexity, and such groupings may be serviceable, though liable to frequent revision and change of boundaries.

Presentative cognitions then may be divided according to complexity into five grades or degrees, as follows :—

Presentative Cognitions of the First Degree—those cognitions in which the mind is occupied with localising upon the body a single sensation, as a burn on the hand or a beam of light on the eye. In these cognitions the representative element is at its minimum.

Presentative Cognitions of the Second Degree—those cognitions wherein the mind cognises a plurality of sensations, localising them upon the body, as when one cognises simultaneous pains in two different points of the body, or when one cognises a body by its touch and smell together, having reference still to the localisation of the sensations. In these cognitions the representative element is more prominent, for to cognise two things as co-existent the mind is obliged to represent one of them in contemplating the other, turning from one to the other alternately; this alternate representation is in addition to the continuous representation in the case of each object by which that object as single is kept before the mind.

Presentative Cognitions of the Third Degree—those cognitions in which the mind cognises a single object in its unity as something external to the mind and apart from its sensational effect upon the organism. These cognitions are the ordinary objects of perception taken singly, as a tree, a house, a block of wood, a leaf, and so forth; they are the presentative-representative cognitions of Mr. Spencer, in which the mind is supplying all the time more or less from past experience. In viewing a brick we see only three sides of it perhaps, the other three being concealed from view; these latter we supply from our representative knowledge. Our perceptions of solidity, distance and direction in given instances are of this degree. The representative element is here quite conspicuous.

Presentative Cognitions of the Fourth Degree—those cognitions whereby the mind cognises a plurality of objects as external to the mind, as when, for instance, I look from my window and see a row of houses, several trees, a church tower, fences, arbours, vines, red and gray clouds. Our presentative cognitions of the external world generally range in this degree.

Presentative Cognitions of the Fifth Degree—ideas of the mind cognised as ideas or mental phenomena. Here presentative cognition and representative cognition seem to meet, the same cognition having both a presentative side and a representative. The connexion of presentative and representative cognition in this manner is not precisely the same as in the case of sensations cognised; there is something superadded. In the latter case the presentative cognition, namely the sensation cognised, is sustained and kept before the mind as a whole by a continuous representation of the preceding presentation, but the representative cognition is not the same with, but different from, the presentative cognition—an idea which goes alongside of the sensation. In the case of an idea not directly connected with a sensation there is a closer union of component parts, so that the *same phenomenon* seems both representative and presentative—presentative as a present mental phenomenon and representative as the medium through which a past phenomenon is recalled. In sensations occur presentative cognition and representative in alternation or running side by side; in ideas we have all that there is in sensations and a mediate cognition besides.

Representative cognitions may be divided in like manner into six grades or degrees, to wit:—

Representative Cognitions of the First Degree—those cognitions which are representations of a single item of presentative cognition considered as a whole, as the recollection of a picture, a face, a feature, a flower, a leaf, a sound, a specific pleasure or pain.

Representative Cognitions of the Second Degree—those cognitions which are representative of a plurality of items of representative cognition considered as wholes; as the recognition of the several parts of a picture or of several pictures, of trees, houses, fences, events, or trains of events which actually have been experienced.

Representative Cognitions of the Third Degree—those cognitions which are combinations of parts and wholes of presentative cognition so as to present recognitions not as wholes, reproductions of any exactly correspondent whole of experience, but in which the constituent parts can still be traced definitely to their sources in experience, as in cognising a particular man with a particular horse's head, or in placing a particular tree we have seen in a valley upon a neighbouring mountain, or in transferring mentally and combining different parts of different landscapes, or making in the mind a different arrangement of the objects in a room.

Representative Cognitions of the Fourth Degree—those cognitions which are combinations of parts and wholes of presentative and representative cognitions such as form general and abstract notions of which the constituent parts do not represent any assignable whole of experience, and cannot as a rule be traced definitely to their sources. These cognitions are expressed in their various sub-degrees of complexity by general and abstract names—*man, tree, house, dog, truth, virtue, justice.*

Representative Cognitions of the Fifth Degree—those cognitions which are combinations and associations of notions in couples with reference to their agreement and difference; as when on seeing an object it is recognised and classed under the general notion *tree*, or when on cognising a given act it is pronounced virtuous or vicious. This class includes judgments and the products of reasoning.

Representative Cognitions of the Sixth Degree—those cognitions which are a complex of all or most of the preceding classes as in the most elaborate products of imagination. We have a cognition of this grade in the picture of a city whose foundations are precious stones —jasper, sapphire, chalcedony, emerald, &c., whose gates are pearl and whose streets are gold, of which I am a resident, or my brother or wife, and in which all the dwellers are perfectly happy and virtuous, where there is perfect freedom and order, where God reigns and of which He is the light.

These remarks upon the respective characteristics of Presentative and Representative knowledge may thus be summed up :—

(1) Presentative and representative cognition exist together; neither is found by itself alone in experience; that which is called presentative is only relatively presentative; that which is called representative is only relatively representative.

(2) Presentative cognition does not exist as a product, strictly speaking; as soon as it passes into a product at the command of the mind, it becomes representative. Nevertheless, through the power of representation we can retain, recall, and classify it by itself.

(3) Presentative cognitions are relatively vivid; representative, relatively faint. Presentative, as presentative, are immediate; representative as such are mediate. Presentative cognitions are relatively simple, representative are relatively complex. In presentative cognitions the continuing impression is the primary object of cognition, the representative element is secondary; in representative cognition the past impression is the primary object, the present continuing idea is secondary. Presentative cognitions are commonly held as original, representative as derivative; in a qualified and limited sense this is correct. Presentative cognitions may be either sensational or ideal; representative cognitions are ideal only. Presentative knowledge is in general more clear and definite; representative generally more obscure and indefinite.

(4) Presentative and representative cognitions may be grouped in classes, but roughly and without very definite and certain lines of divisions. The most natural classification is according to complexity. By this standard five degrees of relatively increasing complexity may

be made of presentative cognitions and six of representative. These are susceptible of very minute subdivisions.

As far back as the eleventh century the Schoolmen observed a distinction to which, though its consequence was overlooked for a period, philosophy has returned and upon which as fundamental and indispensable the science of knowledge grounds itself—the distinction between the knowledge of a thing present as it is present (*cognitio rei praesentis ut praesens est*) and the knowledge of a thing not as it is present (*cognitio rei non ut praesens est*); a distinction so important that, in the language of Sir William Hamilton, without it "the whole philosophy of knowledge must remain involved in ambiguities".

DANIEL GREENLEAF THOMPSON.

The Philosophy of Ethics.—I desire to explain very concisely two points in my article in the January number of MIND, on which I seem to have been misunderstood.

The first point relates to the distinction between *desiring* an object and regarding it *as an end of action.* My critic in the *Spectator*, January 12th, appears to think that I hold these operations to be the same, and very naturally takes exception to a doctrine which must spread confusion through every part of Ethics. But in doing so he mistakes my meaning. Without asserting that it is possible to desire an object and not at the same time to "posit it" as an end of action (a nice point in psychology, with which I do not meddle), I state confidently that the two acts are altogether different; as will at once become obvious to any one who doubts it, if he will consider that we may desire an object intensely, and yet put it very low down in the scale of ultimate ends, while on the other hand we may put it very high up in that scale—even at the very top—and desire it very faintly, or not desire it at all. This is, of course, the explanation of the fact that we so often know the good and do the evil. Our desire for a lower object overcomes what we call our "better judgment," *i.e.*, our judgment that some incompatible object is preferable to it.

I may point out that no writer can be clear or consistent in his statements on these subjects, except (so to speak) by the help of his reader. The problem is to describe moral or ethical judgment without using the word "ought," a word which of course necessarily begs the whole question. In doing so it is absolutely requisite to use such words as "desire" and "prefer," but these words are ambiguous. "Desire" may mean "wish for"—may be the genus of which "appetite" is one species—and in that sense, in which I use it here, must be most carefully distinguished from "the regarding an object as an end of action". But it may also, without doing any violence to common usage, be used in this latter sense; so that a writer is almost forced by the poverty of technical language to use the same word for two things, which it is absolutely necessary for him to keep altogether distinct in his own mind and in that of his readers.

The second point I wish to touch upon refers to my classification of ethical maxims or propositions into moral and non-moral or immoral ones; and I am asked whether it would be proper, in virtue of this classification, to use the word "ought" when speaking of the second or non-moral and immoral group. To put the question in a concrete form—would it be correct, on my theory, to say of a man so filled with resentment that revenge is to him the highest ultimate end, that he *ought* to revenge himself on his enemy?

I reply that the question cannot be answered without some preliminary explanation. For the person who puts the question may mean three things by the word "ought," and may be in search therefore of three different pieces of information. (1) He may want to know whether revenge is in accordance with the recognised moral laws of the community: and the answer to this question (if he happens to be living in England in the nineteenth century) is in the negative. (2) He may want to know whether revenge is consistent with the moral laws which *I*, the person to whom he puts the question, recognise as binding: and in this case, as it happens, the answer is also in the negative. Or (3) he may want to know *whether the proposition prescribing revenge stands in the same ethical relation to the injured man, as the propositions prescribing benevolence (for example) do to the philanthropist to whom the happiness of others is the highest end in itself*; and this question I answer in the affirmative; while I further add that the benevolent man can state no reason for his benevolence which the revengeful man cannot parallel with an exactly similar and equally philosophic reason for his revenge.

ARTHUR JAMES BALFOUR.

Ethics and Psychogony.—The world has no doubt become rather weary of the doctrine of Evolution, and inclined to rebel against its pretensions to revolutionise mental and moral science. When the first shock of a new revelation is over, reaction is sure to follow; and I believe that one of the reasons why Mr. Sidgwick's *Methods of Ethics* was so warmly welcomed, apart from its intrinsic merits, was the relief that men felt at getting back into the old paths of self-introspection and common sense, and their pleasure at seeing Evolutionism boldly sent about its business as a mere intruder whose information was not asked or in any way relevant. No doubt in the Second Edition this has been a good deal altered; the author having, as he tells us in his preface, been led to attach somewhat more importance to the theory of Evolution than formerly: but he still seems to hold that if "men do not *now* normally desire pleasure"—"to say in answer that all men *once* desired pleasure is from an Ethical point of view irrelevant." It would seem therefore that although he now to some extent admits Psychology to Ethics he would still exclude Psychogony from both.

A still stronger expression of the same view is propounded in Mr. Balfour's article in the last number of MIND. Having distinguished between causes which produce and grounds which justify a belief, and assigned the first to Psychology and the second to Philosophy, he says that with regard to ultimate beliefs, of which the differentia is "that there are no grounds for believing them at all," the business of

Philosophy is not to account for or prove them, but simply to disengage them and exhibit them in systematic order. Applying this to the Philosophy of Ethics, and remarking that ethical propositions differ from scientific as not stating facts but duties, he concludes that the ultimate principles of Ethics are *sui generis*, prescribing certain ends as ends-in-themselves, and that "the origin of an ultimate Ethical belief never can affect its validity". The functions of a moralist are therefore not to account for the origin of these ultimate beliefs, or to prove them, or "to justify the judgments which declare which of two final ends is to be preferred," but simply to clear up these ends and judgments and apply them.

Now whether the nature of moral obligation be a problem of Ethics or of Psychology is a mere question of names, (though surely it is hardly questionable that Ethics means more than Casuistry, and includes an inquiry into the 'connotation' as well as the 'denotation' of virtue): but when it is said that "the origin of an ultimate ethical belief can never affect its validity," that is a statement of fact, and a statement which I venture to controvert. I think I can best put my argument in the shape of illustrations.

Suppose a creditor, having after long balancing of accounts arrived at the sum due to him and entered the result in his ledger, came to be cross-examined some years afterwards as to the class of items included in this balance and the principle on which it was made, and that he had then forgotten all about it, even the very fact that he had made it. Suppose now that there was handed to him the paper on which his previous calculations were written, showing all the items which he had added and subtracted, and a total result corresponding to that entered in the ledger; would this paper be or be not useful to 'assist his memory,' and if his recollection had gone beyond recovery, would it or would it not (supposing its genuineness proved) be relevant to the inquiry what was represented by the entry in the ledger? Or suppose a mathematician of authority had worked out an intricate formula and published it, and that this was afterwards found in a certain instance to produce an anomalous result; suppose on this that a friend could find his manuscript calculations showing that the result depended on limitations and conditions which he had omitted to express in it, and which explained the anomaly in the particular instance: would this be irrelevant? If the evidence were excluded, it would be sure to be thought that he had other grounds for his result which were unknown, and which if known might very likely be convincing; and we should thus be reduced simply to a balance of *authority* without the power of verification.

But Mr. Balfour will perhaps object that these are instances of a belief not 'ultimate' but only derivative. I might answer—'That is the very question at issue: till the entry in the ledger and the published formula were explained, they *were* ultimate: they were shown to be derivative only by being derived, and this is just what we propose to do with Ethical formulæ'. But let me take another example. No one can deny that the sensation of hearing is 'ultimate'. Does Mr.

Balfour insist that Acoustics shall deal only with sounds as heard and refuse all information as to vibrations? If so, does he remember that by the theory of vibrations various sensations of hearing have been predicted, as for instance the combination of two sounds to produce silence? Or would he say that a man has not a better knowledge of music if he understands the physical conditions of harmony and timbre, or the mathematical relations of the musical scale? Or take a kindred science to Ethics. There are many maxims or formulæ which may be called 'ultimate principles' of British Politics, and there are 'legal maxims' which may be called 'ultimate principles' of British Law. But would Mr. Balfour say that the meaning or purview of these, or even of an Act of Parliament, which is an 'ultimate principle' *in writing*, can be accurately known without a consideration of the constitutional and legal history of England? If so, how does he account for the prejudice against *doctrinaire* statesmanship, and the shudder which an Englishman feels at any 'theory' of Politics? And if Politics is clearly not bound down to a number of 'ultimate principles,' why should Ethics be so bound?

Speaking generally, I contend that in order to understand the meaning and limits of any proposition it is necessary to know the *grounds* of that proposition; and that if no grounds for it are now apparent, as Mr. Balfour holds to be the case with 'ultimate beliefs,' the only chance is to ascertain if possible what *were* the grounds on which the proposition was first believed—in other words to examine its *origin*. Of course a proposition believed at first on grounds either bad or insufficient to justify it in its full acceptation may afterwards be justified on good and sufficient grounds; but if no new grounds are discovered, it retains only what validity was given it by the old. If these be forgotten, so that the belief comes under the definition of an 'ultimate belief,' and all evidence to refresh the memory is to be rejected as 'irrelevant,' man simply becomes chained down to any illogical belief which his ancestors may have acquired, and the very fact of its being illogical is that which makes him unable to get rid of it, for being a fallacy 'there are no grounds for believing it at all,' hence it is an 'ultimate belief' and no spuriousness of origin can affect its validity. 'We have it *now*,' as Mr. Sidgwick would say, 'what does it matter how we got it?' I on the contrary contend that the existence of a belief is no proof of its truth, unless (and I make the exception only for the sake of argument) it cannot be shown how the belief could have arisen otherwise than on the assumption of its truth. If it can be accounted for as a natural product, but a fallacy, that disposes of any evidence drawn from the fact of its existence.

To apply this to Ethics. Let us grant that there are certain 'ultimate ethical beliefs or propositions' of which the differentia is the word 'ought,' and for which no reason or ground can now be given by Introspection:—let us also grant that the problem of Ethics is not the definition of Virtue, but the enumeration of virtues. Now I allege that by going back to the time when these beliefs first appeared, I can show that the meaning of 'ought' was derived from certain simpler elements of anticipations of pleasures and pains, and that I can ascertain the grounds on which the propositions in question were first believed and stated : I further say that as no other grounds can now be given for them, these original grounds must be taken to be the only measure of the validity, intent, and extent of the propositions in question : I therefore argue that it is only by reference to these original grounds that the man who has to apply these propositions, namely the *moralist*, can guide himself, and I conclude that knowledge of the origin of moral judgments is of primary importance to Ethics. As one cannot truly understand the character of an individual man without having watched its growth or being told his history, so it is impossible to appreciate the moral nature of mankind, or reconcile its dicta, unless we study it not anatomically only, but physiologically, by retracing the steps of its development. Or to take Mr. Sidgwick's instance : I admit, not indeed in his words that 'men do not *now* normally desire pleasure alone but other things such as virtue', but in what I conceive to be the correct expression of the fact, that men do not *now* normally take pleasure in sensual gratification alone, but in other things also such as virtue. But I say that, if I can prove that the pleasure we now take in virtue originally came from and now represents the pleasure which virtuous action produced, I add a valuable piece of information to the man who is inquiring what is the nature of virtue ; for surely, if I show that moral 'good' was made out of pleasures, I thereby disprove the theory that it contains anything else, just as if I show that water is made out of oxygen and hydrogen only, I disprove the theory that it contains carbon. I do not of course argue that in mental chemistry the compound is the exact sum of the components ; but only that there is nothing more in the compound than in the components. By habit part of the components may disappear from consciousness, but no new element can be added. The motive to action need not contain all its original constituents, but it must represent them, and can be nothing but pleasure of some kind.

In Mr. Edgeworth's interesting essay on *New and Old Methods of Ethics*, noticed in the last number of MIND, the author suggests an "eirenicon" between Mr. Sidgwick's view and my own, namely that "non-hedonistic preference is ancestral habit". I fear I cannot accept this. For I do not admit that "habit is an exception to or a modification of the general hedonistic rule": so far as there is any preference or motive at all for an habitual action, I hold that preference or motive to be hedonistic ; the only difference being that the pleasure habitually produced by the action is associated with the *action itself*, so that the action itself becomes an object of desire apart from its consequences. The same thing I hold to be true with regard to the emotions and affections, for not only do I say with Mr. Edgeworth, that these emotions and affections are "generated by association with" (or rather *of*) "experienced pleasure" and pain ; but I add that being thus conglomerations of ideal pleasures and pains, they are themselves pleasurable or painful, and thus, as sources of action, are no exception to the hedonistic rule. Habit, whether individual or ancestral, operates in my view to transfer on the one hand the pleasurable idea from the end to the means, from the object to the action which secures it; and to fuse together on the other hand, or 'psycho-chemically' combine, a number of elemental feelings into a compound feeling or emotion. Thus as new organs or faculties, physical, mental, or moral, are evolved, their exercise becomes *directly* or in itself pleasurable or painful: and it is by this process and not by any supposed 'non-hedonistic preference' that I would explain the phenomenon of the fixed idea, and the other phenomena which Mr. Edgeworth thinks call for explanation. At the same time I gladly admit that the question is "to be decided by careful observation, not off-hand by definition"; and if my comparison of a thermometer (MIND VI., p. 173) had been put forward as an *à priori* proof that desire or action followed the greatest pleasure, I think Mr. Edgeworth's criticism of it, as open to refutation by a discovery similar to that of water not expanding as its temperature is raised from 32° to 39°, would be decisive. It was suggested not as an inflexible standard, but as "the only practical measure" which we have; and if any man can show a clear instance of 'non-hedonistic preference' I shall be quite ready to correct the measure, and register the exception. But I say that the phenomenon of ἀκρασία is not such an exception, because what the measure pretends to register is not pleasures-in-themselves (if I may so speak), that is, considered as all equally distant* and equally certain; but their motive force under particular circumstances, namely those of the actor at the moment of action. Of this latter motive force it seems to me, as I said, that in fact the only practical measure which we have "is in ourselves the resultant desire, in others the resultant action," and that it is *primâ facie* a good measure is shown by the acknowledged *general* correspondence of desire and idea of pleasure. Until an exception to this correspondence is proved, the measure must be taken to be as good a measure as a pair of scales: should such an exception be proved it may turn out to be no more or even less trustworthy than a water-thermometer.

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* Mr. Edgeworth says that I suppose motive force "to diminish, like the attraction of bodies, with the distance, in the inverse ratio of the square of the distance in time," and naturally appends a note of admiration. But I specially pointed out that, time having extension in one dimension only, the function involved was probably that of the *simple* inverse; and what I suggested was that the attraction of pleasure might vary not with the inverse distance alone, but according to some law involving some *function* of that quantity *together with other quantities*, one of which I mentioned (MIND VI., p. 174). However on reconsideration I see that the hypothesis, even as so stated, is incorrect; for it expresses a law of equal distribution of force not in *one*, but in *two* dimensions, in which the equidistant points form a circular line, just as the Newtonian law expresses it in space, which is of *three* dimensions, and in which the equidistant points form a spherical surface. For extension in *one* dimension there are *no* equidistant points, the force is theoretically independent of distance; and I come therefore to the conclusion that to a perfect or omniscient mind of infinite duration the motive power of foreseen pleasure would not vary with its distance in time, and that the effect of 'perspective,' which experience points to, is due to our mental imperfection and finiteness, and depends primarily on difference of *probability*, and only mediately (because of the uncertainty of life and the shortness of foresight) on *remoteness* in time. This correction however does not affect my explanation of ἀκρασία; whatever be the cause why remote pleasures have less motive power than proximate, there can be no doubt of the fact.

As I have been led to mention Mr. Edgeworth's essay, I should like to make two remarks on his 'Calculus of Hedonics,' which seems to me both ably conceived and interesting. The first is that the mere statement of the problem 'to divide a certain quantity of material of pleasure among a number of men so as to produce a maximum of pleasure' is sufficient to show that it is a problem of Politics not of Ethics. The State only can apply the problem: the State only is concerned in solving it. My second observation is that to make the problem at all practical, pain-stuff, or labour, as well as pleasure-stuff, must be included in the distribuend,* and if the problem as modified be 'to make such a distribution as to produce a maximum surplus of pleasure over pain,' the conclusion reached is favourable to Egoism. For if I do my sum accurately (as to which I am not sufficiently at home in the Hedonic Calculus to feel very confident), the answer to the problem, supposing the capacity for pleasure and pain to be constant, would be that the labour must be concentrated as much as possible, or at least up to a certain limit, and the means of pleasure applied first in alleviating the pain of labour, and then equally divided; and supposing the capacity to vary, those who have the least capacity should be made to do the work, and the pleasure-stuff after paying a certain amount of wages to the workers, should go to those who have the greatest capacity for pleasure. This then, if the calculation be correct, is the meaning of 'Exact Utilitarianism' when the principle is applied as nearly as may be to actual facts. Now if we assume, as seems (speaking generally) to be the fact, that the higher a being in the scale of evolution, the higher its capacity for pleasure, the result pointed out is just that which is produced by the 'struggle for existence,' or Egoism; but is *not* that which would be produced if moral practice followed ordinary Utilitarian principles: for in that case the best individuals would be those who would most readily do more than their share of work and give up their share of pleasure to the rest, so that the *lower* natures would monopolise the *pleasure-stuff* and the

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* Practically the problem is still more complex, for the sum of pleasure-stuff and pain-stuff is itself not constant but must be determined so as to supply a maximum answer to the problem stated in the text. It may be that more labour might be applied so as to produce more pleasure than the pain it cost the labourer. If so, it must be exacted, and so on until the turning-point be reached at which this is no longer the case. Further, it is evident that the higher pleasures, such as those of affection and virtue, can hardly be said to come from pleasure-stuff at all, certainly not to be proportional to it; and similarly with pains: so that the problem as stated is only a small portion of the real problem of producing a total maximum surplus of pleasure.

higher the *pain-stuff*, the most infelicific instead of the most felicific arrangement. The moral I would draw is this : If 'Exact Utilitarianism' be the end of Politics (as is plausible), it is best attained by non-interference with nature to any extent further than to secure fair play in the struggle for existence by eliminating, so far as they do not affect merit, the accidents of wealth, rank and so forth and confining the struggle to merit only, and so to hasten the course of development : if it be the end of Ethics (which I deny), Utilitarian Ethics will best attain its end by practising its own 'preachment' of self-abnegation, and doing all it can to forward that vulgar form of Egoism of which the maxim is success. If it continue to urge men to sacrifice their interests to others otherwise than as the best means to their own success, the best men (who alone will obey) will get less than their proper share, and the total maximum will be spoilt. Thus it would seem that the 'exact' application of the principle of Utility to Ethics is possible only through some method of Egoism.

ALFRED BARRATT.

J. S. Mill's Philosophy tested by Prof. Jevons.—In Prof. Jevons's review of Mill's arguments respecting the ground of our belief in the axioms of Geometry, there occurs a very extraordinary misapprehension. The proposition which Mill seeks to establish (*Logic*, Book II., c. v., §§ 4, 5), is that these axioms are "experimental truths; generalisations from observation. The proposition, Two straight lines cannot enclose a space—or in other words, Two straight lines which have once met, do not meet again, but continue to diverge—is an induction from the evidence of our senses". With his usual clearness, he proceeds to state the objection most likely to be made to this view. His theory being that "we see a property of straight lines to be true by merely fancying ourselves to be looking at them," this probable objection is that, if such be the case, "the ground of our belief cannot be the senses or experience; it must be something mental," for "experience must be *real* looking". This statement of objections is continued thus :—

– See T. H. Gr

> "To this argument it might be added in the case of this particular axiom . . . that the evidence of it from actual ocular inspection is not only unnecessary, but unattainable. What says the axiom? That two straight lines *cannot* enclose a space; that after having once intersected, if they are prolonged to infinity they do not meet, but continue to diverge from one another. How can this, in any single case, be proved by actual observation? We may follow the lines to any distance we please; but we cannot follow them to infinity: for aught our senses can testify, they may, immediately beyond the farthest point to which we have traced them, begin to approach and at last meet. Unless, therefore, we had some other proof of the impossibility than observation affords us, we should have no ground for believing the axiom at all."

I must call attention to the fact that the whole of this passage is contained in a single paragraph. The first sentence of the next paragraph runs thus :—

"*To these arguments, which I trust I cannot be accused of understating, a satisfactory answer will, I conceive, be found,* if we advert to one of the characteristic properties of geometrical forms."

Can any one having these two paragraphs before his eyes doubt that the *whole* of the first is a representation of the arguments of a supposed objector? If proof of so palpable a fact be required, is it not sufficiently furnished by the words which I have italicised, which distinctly imply that what has gone before is the objection? This exposition closely followed by criticism is eminently characteristic of Mill.

Now observe Prof. Jevons's reading of this very clear passage which he himself quotes in full at p. 174. He claims to have convicted Mill of gross inconsistency. For was it not said that the axioms are inductions from the evidence of our senses? And are we not now told that we "must have some *further* proof . . . than observation affords us"? Unfortunately, of the two statements quoted in proof of the charge of inconsistency, one is not a statement of Mill's opinion at all. He quotes it as the statement of a supposed opponent, and immediately proceeds to reply to it. Prof. Jevons mistakes the exposition for the reply, supposing the latter to begin with the words, "What says the axiom," etc. Yet surely this is a mistake which a moment's glance at the context, and especially at the words which I have italicised, ought to have prevented.

No doubt, if the "essential illogicality" of Mill's mind can be proved by ascribing to him a statement which he represents as that of an opponent, Prof. Jevons will succeed in his undertaking. It may be some comfort to Mill's disciples to reflect that, on these principles, their revenge is equally easy.

ARTHUR STRACHEY.

Since the publication of my articles on Mill's *Logic* in the *Contemporary Review* of December and of January last, I have been puzzled by the position taken up in regard to them by some of Mill's admirers. They were well aware, they say, of Mill's inconsistencies, and they see no reason why such petty criticisms should be brought against a great logician. "They are perfectly familiar," says my friend and colleague, the Editor of MIND (No. IX., p. 142), "with all the inconsistencies that Prof. Jevons would now laboriously bring to light; and yet they can honour the man, &c." This is perplexing; for if the Editor is familiar with the inconsistencies, these must really exist. But, as logicians, surely we are nothing if we are not logical, and if Mill really has fallen into the inconsistencies which I have pointed out, and shall point out, his work may be a suggestive piece of criticism, it may be a powerful polemic, an instructive review of logical doctrines,—anything else you like to call it, but not "a system" of logic.

The Editor appears to be annoyed that I have occasionally printed the word "system" between inverted commas, and he wants to know whether I mean anything by it. Of course, I mean a great deal—that what is called by Mill a *system*, is as far from being a system as it is possible to conceive. The Editor says, indeed, "Mill's book is a model of orderly methodical exposition". He must have written this, it is true, before my second article was published, in which I showed that Mill first treats the relation of Resemblance as a minor and exceptional matter of fact; that in the third book he makes it the pivot of his methods of induction; while lastly, in the 24th chapter of his third book, he discovers that it is seldom regarded as a subject of science. Is this orderly methodical exposition? Or is it methodical ① to make induction rest upon the law of causation, and the law of causation upon induction? Or to make induction consist in inference *from particulars to particulars* in the second book, and then to discover, in the third book (chapters first and second), that the characteristic ② quality of induction is to obtain a *general* result from particular instances. But these and other specimens of systematic thought will require much analysis.

To turn now to the subject of geometrical reasoning, I deny altogether that the Editor has met even the two cases of inconsistency which he has selected from those I pointed out. I proved by minutely authenticated extracts, that Mill positively denied the existence of real straight lines in nature; he says, nevertheless, that we learn the properties of straight lines by mental experimentation on the images of straight lines in the mind; as we cannot follow straight lines ocularly to any great distance, we follow them in imagination, and try what will happen; these imaginary lines, he says, exactly resemble real ones, a fact which, curiously enough, we learn by observation; it follows unquestionably that, if we discover in these imaginary lines the properties of straight lines, they must be really, that is *perfectly straight;* if so, the real ones, which they *exactly* resemble, must be perfectly straight. There is no possibility of escape from Mill's statements. The Editor, indeed, ingeniously suggests, that "in denying (with whatever reason) that straight lines really exist, Mill never says that we have no perception of lines as apparently straight. So, when he comes to deal with the imaginary lines by which he supposes the geometer able to increase his experience indefinitely, he may very well say that these exactly resemble the lines that are perceptibly (without being really) straight." That is to say, Mill after having made geometrical reasoning the crucial test of his philosophy, having written several laborious chapters on the subject, and having had seven opportunities of revising those chapters in new editions, leaves us still to judge of his doctrine, not by what he has so abundantly said, but by what he has left unsaid. He may have meant, in some of his phases of thought, that lines were *perceptibly straight to us,* when they were not really straight; but, after studying his statements perhaps more closely than any one ever did before, I do not think that the distinction is alluded to by Mill. The Editor gives no reference, and apparently means that Mill might now urge this, if he were alive, because he has not said anything to exclude him from such a position.

This, however, I can hardly admit; because, if the Editor means that when a line is apparently straight, our mental image of it is not perfectly straight, this image will not serve the purpose of the direct mental experimentation advocated by Mill; but if the image is that of a *perfectly straight line*, then Mill denies its existence, saying, "Since, then, neither in nature, nor in the human mind, do there exist any objects exactly corresponding to the definitions of geometry —&c." (Book II., chap. 5, section 1, beginning of third paragraph.) Nobody ever undertook a more hopeless task than to try and reconcile Mill's statements. His principal doctrine is that we can empirically learn the properties of geometrical figures, although there are no such figures to apply our eyes and minds to.

After thus showing that Mill might have said and meant what he did not say nor apparently mean, the Editor suddenly disclaims any desire to defend Mill:—"However it is no affair of mine to defend Mill's positions. I, for one, cannot think of basing the knowledge of geometrical principles on individual experience, least of all on that kind of passive experience, received by way of the senses, which Mill, without making proper use of the psychology he accepted, generally was content to assume." It seems, then, that the Editor approves neither of the substance of Mill's doctrines, nor of the manner in which he expounded them; he has always been familiar with the inconsistencies which I point out, and moreover there are discrepant assertions which Lange has established. I fail to see then on what grounds the Editor objects so much to my attack. If Mill's doctrine is really wrong and his exposition often self-contradictory, surely the worst I can do is to waste powder and shot—a matter for my own consideration.

Finally, the Editor gives me a few words of advice, and hints that I shall not retain my place, unless after criticising Mill, or rather, I suppose, *while* criticising Mill, I imitate him in reconstructing the damaged edifice of philosophy. The Editor asks (p. 144): "Will he then, for once in a way, tell us quite plainly what he considers are all the elements of a *true* empirical philosophy?" To which I answer, plainly enough—certainly not! Is no man to be a critic, unless he is prepared at once to propose a complete system of philosophy? Is a mathematician not to point out the blunders of a brother mathematician, unless he presents at the same time a mathematical theory of the Universe? Such a demand would render all criticism impossible, and without criticism we should still be speculating about the philosopher's stone, alchemy, realism, and all the absurdities of the scholastic age. In philosophy as well as physical science, truth has continually arisen from the freedom of criticism, and from conflict of opinion.

But I may be allowed to point out that I can hardly be charged with avoiding the labour of constructive writing. In the *Principles of Science*, the second edition of which is noticed and criticised in two separate parts of the same number of MIND,* I have given my view of the true forms of reasoning, both deductive and inductive. In typographical extent my book amounts to about two thirds of Mill's System; moreover, it is almost wholly constructive. I purposely avoided Mill's manner of mixing up controversy with exposition, because it is not calculated to lead to clearness of vision. Much of the mystification which overcomes the readers of Mill's works, arises from the fact that Mill is always controversial. He never lays down the bases of a scientific position in a colourless and impartial manner. In almost every paragraph he has a fling at some real or imaginary opponent; indeed the whole "system" is an avowed piece of polemical writing. In the *Autobiography* (pp. 225-227) he candidly explains that the purpose of his book was to overthrow the great intellectual support of false doctrines and bad institutions. Now I respectfully decline to follow Mill's example, or the Editor's advice. In the *Principles of Science* I have done as much constructive logical work as I feel able to do at present, and now I intend to do some destructive work, without mixing together two utterly distinct kinds of composition.

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* The acute objections of Mr. George Bruce Halsted, of the John Hopkins University, to my criticism of Boole's Logic (MIND, No. IX., p. 134) certainly demand a careful answer. While admitting that I may have

It is true that I have never attempted to assign "all the elements of a *true* empirical philosophy". The Editor, while asking whether I will do it, knows that I shall not accept the challenge, since I have in fact, in the *Principles* (and anew in replying to his critique in the preface to the second edition) disclaimed any attempt to get to the basis of reasoning. Whether in future years I shall do anything more satisfactory to the Editor, depends upon length of life, and upon various circumstances over which no one has control. My own belief is that false philosophy generally arises from premature attempts to solve what is yet far beyond our ken. Thales was a very wise man, no doubt, but he made the mistake of propounding a philosophy of nature. Moisture, he held, was the origin of all things. This grand doctrine seems to me to bear about the same relation to the present bodies of physical science, as the metaphysical doctrines of a Mill, or a Kant, or a Hegel, will bear to the true philosophy of a future age. I decline to meddle with Permanent Possibilities of Sensation, or with such lofty themes as the Knowable and Unknowable, the Absolute, the Unconditioned and the like. Even "all the elements of a true empirical philosophy" are beyond my comprehension. Enough for me if I can firmly plant a few footsteps in the ground already trodden by John Herschel, by Boole, or by De Morgan. But however this may be, I claim the right to expose the mystification and the bad logic of Mill, independently of any efforts at constructive thought.

W. STANLEY JEVONS.

[Nobody could have a better right than the distinguished author of the *Principles of Science* to reclaim against the observations that I pre-

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formerly interpreted Boole's use of the word Algebra too narrowly, I do not allow the correctness of Mr. Halsted's other objections. The points at issue cannot be dismissed in an off-hand manner, and involve questions of depth and difficulty.

sumed to make on the opening scene of his campaign against Mill, and with his rejoinder the incident might well be regarded as closed, so far as this journal is concerned. I shall hardly, however, be thought to abuse an editor's proverbial privilege if, after he has thus formally dedicated himself to the work of destruction, I add one 'last word' or two.

I see no occasion to recur to his criticism on Mill's view of geometrical science, being content to leave that matter as it stood between him and Mill, and to leave the particular point I formerly noted as it now stands between him and me. (How little careful he was at another point in the original attack is noted by a different hand on a previous page.) Neither will I enter upon his second article: I have seen already in print two pointed exposures of his misreading of Mill's plain meaning as to the relation of Resemblance, and what is the use of a third? But I say (or repeat) of his enterprise generally that it betrays a serious want of perception. Whatever Mill's philosophic sins may be, he does not wield anything like the kind of despotic sway that could alone excuse this violence of attack; and Prof. Jevons ought to know it. Or if he does not know it, and is really convinced that no more pressing work lies to hand to be done, then it cannot be amiss to give him warning that he must not be astonished if he finds his labour disregarded by philosophical workers who, while thankful to have learned from Mill, do not need now to be told that his theory of knowledge was insufficient and landed him in conclusions not always consistent either among themselves or with fact. At the end of his second paper in the *Contemporary Review*, Prof. Jevons says, not without a touch of pathos, that intensely believing as he does that the philosophy of the Mills, both father and son, is a false one, he claims, almost as a right, the attention of those who have sufficiently studied the matters in dispute to judge the arduous work of criticism he has felt it his duty to undertake. I can only remark that I am surprised at this time of day that he should expect it, and I do not think he will get it.

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He, on his side, appears to be surprised that those whom he styles "admirers" of Mill should concede the presence of inconsistencies in that thinker, and not see that there is an end of his character as a logician. But suppose one should say that the writer who makes the contradictory statements noted in MIND, No. II., p. 212, or those noted at p. 216, and again (on their repetition in a new edition of his work) in No. IX., p. 148, with many more like them, cannot have done admirable work in logic. The saying would be obviously unjust. Suppose one went still farther and said that such a writer could be no logician. The saying would refute itself by its extravagance. Yet both sayings would be exactly in the manner of Prof. Jevons as regards Mill.

Concerning "destructive work" in Philosophy there is, finally, this remark to make. Prof. Jevons will find it hard to show that the cause of truth has ever been advanced by such purely negative criticism as he is now attempting. The *Nouveaux Essais* of Leibnitz was a very effective piece of negation, but chiefly by reason of the positive doctrine suggested or expressed at every step of the discussion. So with Mill's own *Examination of Hamilton*, as I have before observed. Whether Prof. Jevons is right in what he now says about Mill's manner of writing generally, must be left to the judgment of the impartial reader. It is quite true that Mill had an essentially dialectical mind and emerged into clearness of view through conflict; but it was only for the sake of clearness that he engaged in conflict, and he did emerge. In his way he was a constructive thinker. He had thought out his philosophy. Prof. Jevons fancies that if a man has written with a constructive intention about

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logical forms, scientific method and the like, he has purchased the right to do nothing but destroy in the philosophical field. But this is to mistake. No man really constructs in logic who does not lay a philosophical basis; and so far from knowing that Prof. Jevons would decline the challenge to declare himself on fundamental questions, I desire once more in all earnestness to urge upon him that nothing so nearly concerns his reputation. He has gone much too far already in these matters to have it in his power to affect all this modesty of purpose. Or is it seriously meant that he must "decline to meddle with" questions of philosophy? Why then meddle with the philosophy of Mill? The able specialists in whose steps he professes to tread were wiser in their generation.—EDITOR.]

IX.—NEW BOOKS.

Life and Letters of James Hinton. Edited by ELLICE HOPKINS, with an Introduction by Sir W. W. Gull. London: Kegan Paul & Co., 1878. Pp. 371.

The short memoir of James Hinton (by Dr. J. F. Payne) that appeared in MIND II. upon his unexpected death, is proved by this most interesting book to have been as correct in its statement of the main incidents of his life as it was clear and accurate in its indication of his point of view in philosophy. Sir W. Gull, one of Hinton's most intimate friends, gives now another admirable presentation, in short compass, of his characteristic manner of thinking. The Editor's part is throughout performed with great tact and discrimination. The book is a worthy record of a life of consuming intellectual activity directed by a nobility of purpose rarely equalled among men.

A Monograph on Sleep and Dream: their Physiology and Psychology. By EDWARD W. COX. London: Longmans, 1878. Pp. 91.

"Sleep and Dream are familiar physical and psychical conditions, disputed by none and which cannot be ascribed to prepossession, dominant ideas or diluted insanity," says the author, apparently having in his mind some others which can be so ascribed. The conclusion he comes to at the end of his investigation is that "Sleep indicates a *dual* structure—that mind and body are not one;" while Dream seems to prove to him farther that there is an 'I,' which, because it "views and remembers the action of the brain (which is the material organ of the mind), cannot be the brain itself nor the mind itself, but must be something distinct from either, although intimately associated with both." Presently, however, this "I" or "Soul" or "Spirit" appears, in the author's view, to fall together again with "Mind," for we hear of man as being simply "a living soul clothed with a material body". Anyhow, of this soul "the molecular body is but the incrustation, the atoms agglomerated into molecules at the point of contact with the molecularly constructed world in which the present stage of its existence is passed"; while the existence of soul itself "can be proved in precisely the same manner as the existence of electricity and magnetism and heat". These views "caused considerable discussion" when set forth by the author to "The Psychological Society of Great Britain," of which he is President.

The Evolution of Morality. Being a History of the Development of Moral Culture. By C. Staniland Wake. 2 vols. London: Trübner, 1878. Pp. 505, 474.

The object of this work is to show how far the doctrine of Evolution is applicable to the field of morals. It is assumed that certain principles of man's being are brought into active operation in the particular line or direction named "moral," by influences that are chiefly social. The treatment is as far as possible historical; the moral ideas entertained by peoples of different degrees of culture being first set forth, before the endeavour is made to explain their origin. The morality of all primitive peoples was found to have much in common, and as no general and connected description of it existed, it was determined at the risk of interfering with the general aim of the work to supply this deficiency. The aim, however, was to trace the general progress of moral development, and not to explain completely the special phases of it exhibited by different peoples, as, for example, the more cultivated Mohammedan nations among which no new moral feature emerged. The moral teachings of Greek philosophy are not specially considered, because it is doubtful how far they directly influenced the popular morals. Sexual morality is frequently referred to by the way, but the full treatment of "what has become in modern thought almost a separate branch of morals" is left over, as also the related question of the "Fall". In the later chapters an attempt is made not only to explain the religious and moral phases of modern peoples in the light of the experiences of past ages, but also to forecast the future advance of mankind on the path of religious and moral culture. The ground covered by the author may be judged from the following headings of his chapters: 'Modern Theories of Morals'; 'The Sense of Right' (a long account of the morality of the uncultured races, in four chapters); 'Genesis of the Moral Idea' (two chapters); 'The Altruistic Sentiment'; Special development of Altruism'; 'Positive Phases of Morals'; 'Doctrine of Emanations'; 'Hinduism'; 'Buddhism'; 'Mithraism'; 'Christianity'; 'Positivism'; 'Religion and Morality'. A sufficiently conglomerate production, yet withal a valuable collection of facts.

Gotthold Ephraim Lessing: His Life and his Works. By Helen Zimmern. London: Longmans, 1878. Pp. 446.

Miss Zimmern's book, long announced and wholly written before the appearance of Mr. Sime's larger biography noticed in the previous number, is a very straightforward and satisfactory presentation of its subject in general, but does not contain much reference to the philosophical thinking of Lessing. There is a curious remark about Spinoza's *Ethica* on p. 435.

A Dictionary of English Philosophical Terms. By FRANCIS GARDEN, M.A., Sub-dean of Her Majesty's Chapels Royal, &c. London, &c.: Rivingtons, 1878. Pp. 161.

The present little volume will hardly disprove Professor Adamson's assertion in a former number, when reviewing a new edition of the late Dr. Fleming's more pretentious work, that Vocabularies of Philosophy are generally of little value. Nevertheless philosophical readers may find here and there in its pages some new information worth remembering, and they will come across observations that do credit to the author's judgment. His reading cannot be called wide at any stage, and in particular there is little trace of familiarity with recent philosophical literature (after Coleridge and Hamilton), but he gives interesting references to some of the earlier and less-known English writers in philosophy or theology, and as far as he goes he is careful and accurate. It would be easy to point to omissions, as, for example, when speaking of Optimism and declaring that he is "not aware that the question is now frequently raised," he has nothing at all suggested to him about Pessimism; or to quite ineffective statements like this about Monad—"A unit—the term is a technical one in ancient Greek theology and in a different application in the philosophy of Leibnitz." Under Subject, he notes a passage in the *Lectures on Metaphysics*, Vol. I., p. 162, where (without check from his editors) Hamilton seems to betray ignorance of the transposition that has taken place since the Scholastic period in the use of the words 'subject' and 'object'; and the point is sufficiently remarkable. But it might have been added that in the later-written Note B. at the end of Reid's *Works* (p. 806), the exact history of the words is very fully given by the learned thinker.

Phases of Modern Doctrine, in relation to the Intellectual and Active Powers of Nature and Man. By JAMES HAWKINS. London: Longmans, 1878. Pp. 304.

"In the foregoing pages of this little work, we have humbly endeavoured to show that although intellect is an independent growth; civilisation the erratic outcome of issues; religion, like speech, a human invention slowly but perpetually on the change; and that science has itself become almost a visible deity—there are still a great number of mysteries connected with the intellect of Nature which science with all its tests and experiments, and philosophy with all its explorations, know nothing at all about. Neither can science nor philosophy throw the least gleam of light upon that deeply-recessed spirit-life, the soul, considered as human reason, or the true and only motive power of the intellect in man."

Das Leben der Seele, in Monographien über seine Erscheinungen und Gesetze. Von Prof. Dr. M. LAZARUS. Zweite, erweiterte und vermehrte Auflage. Bd. II. Berlin: Dümmler, 1878. Pp. 406.

The first volume of this new and greatly changed edition of the author's well-known work (originally published rather more than twenty years ago) appeared in 1876, as noted at the time in MIND. This second volume was meant to include, besides the three monographs—'Mind and Speech,' 'Tact,' 'Blending and Co-operation of the Arts'—originally composing it, a fourth 'On the Origin of Morality' (presumably, the same as that published separately by the author in 1860 and again in 1867). As it now appears, however, the volume is wholly taken up with the first of the four subjects. The Science of Language has in recent years become so greatly developed, that the author could not within shorter compass attain his object of giving a commensurate expansion to the psychological treatment. In the present monograph, as throughout his whole series, he seeks "not only to elucidate the particular subject in hand but to draw out from it the general laws of mental life," and many doctrines, including that of Heredity, merely foreshadowed twenty years ago, have now to be fully considered. Besides an Introduction and Conclusion, the treatise has five parts: (1) Relation between Mind and Body; (2) Origin of Speech; (3) Acquisition and Development of Speech; (4) Influence of Speech on Thought *(Geist)*; (5) Congruence of Speech and Thought and the question of Mutual Understanding (*Verständniss*). What strikes the author most at the end of his inquiry is the fact that many points of doctrine formerly supposed to be best established, have been reduced, in the progress of investigation, to the state of inchoate opinion. It will be remembered that Steinthal, co-editor with Lazarus of the *Vierteljahrsschrift für Völkerpsychologie u. Sprachwissenschaft*, lately published *his* maturest views on Language in a new edition of his *Ursprung der Sprache* (MIND VI., p. 276).

Die Philosophie in ihrer Geschichte. I., Psychologie. Von Dr. FRIEDRICH HARMS, ord. Prof. an der Univ. zu Berlin. Berlin: Grieben, 1878. Pp. 398.

In opposition to the all-engrossing Empirism of the present day, the author contends for the independence of Philosophy as a distinct form of science with a method of its own conformed to the peculiarity of its subject-matter. He lays particular stress on the necessity of supplementing the natural by the historical sciences for the true appreciation of facts, and holds that there can be no true Philosophy if the notion of experience is limited to our knowledge of nature. In the development of Philosophy itself, historical consideration must go hand in hand with systematic construction; and accordingly the author proceeds in his present volume to consider specially the historical development of Psychology, which, being with him a discipline subordinate to Philosophy, reflects in its changing doctrines the change of philosophical views. How completely the theory of the nature of the soul is determined by the general philosophical conception (physical and metaphysical) appears, according to the author, in the Greeks who had no Psychology but as a department of Physics. Later on, three periods in the history of Philosophy are to be distinguished, headed by Augustine, Descartes, and Kant. With Augustine begins the psychological and subjective way of cognition. Descartes destroyed the notion of a mere difference of degree between mind and body, and first (?) established their difference in kind. Kant rejected the "psychologism" as well of Leibnitz as of Locke and Hume, which made Psychology either the foundation of Philosophy or a Metaphysic of the Sciences, and worked out Criticism instead as a Transcendental Philosophy. "Within German Philosophy since Kant three forms of Psychology have appeared. One treats it as the doctrine of the faculties and activities of the soul, whereon its life depends. A second seeks to deduce the necessary stages of development in the history and life of the soul from its action and end. The third is Herbart's mechanics of representation. All three are based on general principles and processes of cognition, and arise in the application of these to psychical experience."

Zur Erkenntnisstheorie und Ethik. Drei philosophische Abhandlungen. Von Dr. J. H. Witte, Docenten der Phil. an der Univ. Bonn. Berlin: H. R. Mecklenburg, 1877. Pp. 122.

Three Essays by the author of *Salomon Maimon* (see Prof. Wundt's article in Mind No. VIII., p. 515), in continuation of the line of thought opened out in his *Vorstudien zur Erkenntniss des unerfahrbaren Seins* (1876). He then dealt with (1) the Problem of Philosophy and the value of History of Philosophy, (2) Modern Philosophy before Kant and the Critical point of view. Now his subjects are (1) the beginning of the Critical Philosophy and the Introspective Inquiry into the *Apriori*, (2) the doctrine of Reasoning, (3) Moral Freedom and the Organic view of things (*à propos* of Kant and Trendelenburg).

In Sachen der Psychophysik. Von G. Th. Fechner. Leipzig: Breitkopf u. Härtel, 1877. Pp. 223.

The venerable author contributes to the *Vierteljahrsschrift für wiss. Philosophie*, II., 1, the following statement:—

"The author's *Elemente der Psychophysik*, published in 1860, has in some respects been favourably received and in other respects has met with opposition. So far as he is aware, his principle of the measure of sensation, based on the functional relation between sensation and stimulus, has never yet been directly opposed; also the psychophysical methods of measurement (partly original and partly wrought out after others) which lead to the measure of sensation, have been generally accepted. But all the more strongly have objections been raised against his statement of the *laws* determining the dependence of sensation on stimulus, from which he follows out the measure of sensation; and also against his translation of this dependence into a corresponding dependence of sensation upon psychophysical activity, which involves his view of the quantitative ground-relation between body and mind. These objections, urged chiefly by Helmholtz, Aubert, Mach, Bernstein, Plateau, Brentano, Delbœuf, Hering and Langer, have gradually grown to such a head that the whole psychophysical system of the *Elemente* may seem to be thereby not only shaken but undermined. The opposition of the three last-named inquirers is the most serious, while Bernstein, Delbœuf and Hering have set up altogether new points of view in place of the author's. However, he has not been able to persuade himself of the validity either of the objections, so far as they touch really fundamental points, or of the new views his opponents would substitute ; and this is what he sets out in the present little work, besides giving a critical exposition of the later experimental researches on Weber's law."

Psychologische Analysen auf physiologischer Grundlage. Ein Versuch zur Neubegründung der Seelenlehre. Von ADOLF HORWICZ. Zweiter Theil, zweite Hälfte. 'Die Analyse der qualitativen Gefühle.' Magdeburg : Faber, 1878. Pp. 524.

The first and general part of this important psychological work appeared in 1872, followed by the special analysis of Thought or Intelligence in 1875. The remainder of the work, to include, as then announced, the analysis of the Feelings, Desires and General Moods or Dispositions *(Gesammtzustände)*, was to have appeared shortly afterwards, but the execution of the author's plan has been delayed, and the present volume, notwithstanding its size, includes only the treatment of the Feelings. These, in their qualitative aspect, are divided by the author under four heads : (1) Sense-Feelings, (2) Aesthetic Feelings, (3) Intellectual Feelings, (4) Moral Feelings. The treatment especially of the Moral Feelings (interpreted in the widest sense) is very elaborate. In dealing with the Sense-Feelings the author shows, as in his earlier parts, an intimate acquaintance with the physiological investigations of his countrymen. The whole work is marked by considerable originality, and may at some future time receive the detailed notice which it deserves as a characteristically German attempt to investigate the phenomena of mental life in the spirit of positive science.

X.—NEWS.

Mr. Leslie Stephen sends the following note :—

"Mr. Carveth Read, in the last number of MIND, objects to Prof. Bowen's use of the word 'speculatist'; and it must be admitted that the word has now come to be an Americanism. Like other Americanisms, however, it may be defended by good English authority. It is not in the early editions of Johnson's Dictionary, but it is used by the lexicographer himself. Thus in the *Rambler*, No. 54, he says : 'Though the *speculatist* may see the folly of terrestrial hopes, fears and desires, every hour will give proofs that he never felt it.' Johnson uses the same word elsewhere, as also the less familiar 'controvertist'. It is to be found in other writers of the time, as Tucker, Priestley (I think) and Cowper. The last says in the 'Progress of Error,'

"'Fresh confidence the speculatist takes
From every hairbrained proselyte he makes.'"

The John Stuart Mill memorial statue, in bronze by Mr. Woolner, has now been erected on the Thames Embankment, near the Temple. The surplus of the memorial fund, amounting to about £500, will be made over to University College, London, for the foundation of a yearly Scholarship of not less than £20 in Philosophy of Mind and Logic. In making this disposition of the money, rather than giving it for Political Economy, the Committee was partly guided by the assurance conveyed to it of the opinion held by Mill himself as to the superior educational value of Logic. The Stuart Mill Scholarship will thus be attached to the academic chair that was endowed by Grote on his decease, and that had its scope defined originally by James Mill fifty years ago (in a paper from which some extracts were made in MIND IV., 533).

Ernst Heinrich Weber, author of the famous article 'Tastsinn,' in Wagner's *Handwörterbuch der Physiologie*, upon which has followed so much fruitful investigation in psychophysics by himself and others, died at Leipsic (where he had been professor from 1821) on January 26, at the age of 83.

A Committee (says *Nature*) has been formed at Königsberg to erect a fitting monument on Kant's grave. The city authorities have headed the subscription list with a sum of 4000 marks (£200).

The first number of '*Brain :* A Journal of Neurology,' edited by Drs. Bucknill, Crichton-Browne, Ferrier and Hughlings-Jackson, and published by Messrs. Macmillan & Co., is announced to appear on April 1st. The Journal will be continued quarterly, and will include in its scope all that relates to the anatomy, physiology, pathology and therapeutics of the Nervous System. "The functions and diseases of the nervous system will be discussed both in their physiological and psychological aspects; but mental phenomena will be treated only in correlation with their anatomical substrata, and mental disease will be investigated as far as possible by the methods applicable to nervous diseases in general."

Hume's *Treatise of Human Nature* (Part I., 'Of the Understanding') is now for the first time translated into French, by MM. Renouvier and Pillon, in a handy volume, published at the Bureau of their weekly journal *La Critique Philosophique.* The volume includes also a revised translation (Mérian) of the *Inquiry concerning Human Understanding*, and a general Introduction from the pen of M. Pillon. This translation is a new evidence of the extraordinary philosophical activity displayed by M. Renouvier and his fellow-worker; and they now promise to supplement their weekly discussion of philosophical and political subjects by a quarterly issue, to begin in May, of six or seven sheets bearing specially on the field of religious criticism.

JOURNAL OF SPECULATIVE PHILOSOPHY.—Vol. XI. No. 4. Hegel—'Symbolic Art' (transl.). Kant—'Anthropology' (transl.). Schelling—'The Method of University Study' (transl.). J. Hutchison Stirling—'I am that I am' (poem). Goeschel—'The Immortality of the Soul' (transl.) . . . V. Hartmann—'Darwinism' (transl.). Rosenkranz—'Hegel and his Contemporaries' (transl.). Notes and Discussions. Book Notices.

REVUE PHILOSOPHIQUE.—3me Année, No. I. Herbert Spencer—'Études de Sociologie' (I.). Dr. Ch. Richet—'Sur la méthode de la Psychologie physiologique'. J. Delboeuf—'La loi psychophysique et le nouveau livre de Fechner' (I.). A. Gérard—'Les tendances critiques en Allemagne: Helmholtz et du Bois-Reymond'. Analyses et Comptes-rendus (Grant

Allen, *Physiological Æsthetics, &c.).* Rev. des Périodiques. No. II. H. Spencer—'Etudes de Sociologie' (II.). J. Delboeuf—'La loi psychophysique et le nouveau livre de Fechner' (fin). P. Regnaud—'Philosophie Indienne : Les dogmes de l' École Védanta'. Variétés—'Un théologien philosophique : D. F. Strauss'. Analyses et Comptes-rendus. Correspondance—'La Psychologie physiologique' (Egger, Richet). No. III. P. Mantegazza—'Essai sur la transformation des forces psychiques'. L. Carrau—'Moralistes Anglais contemporains : M. H. Sidgwick' (I.). H. Spencer—'Études de Sociologie' (III.). Notes et Discussions—'Les Mathématiques et la Psychologie' (P. Janet). Analyses et Comptes-rendus. Revue des Périodiques.

La Critique Philosophique.—VIme Année, Nos. 48-52 ; VIIme Année, Nos. 1-6. F. Pillon—'Quel est le veritable père de la psychologie associationiste ?' (48) ; La fin de l' ordre moral' (49) ; 'Importance de la morale' (1) ; 'Claude Bernard' (4) ; 'La biologie selon A. Comte et selon Cl. Bernard (5). C. Renouvier—'Les labyrinthes de la métaphysique : L'infini et le continu—Une évolution personelle' (50) ; 'La question de la peine de mort traitée scientifiquement' (51, 52) ; 'Examen des *Principes de Psychologie* de Spencer : La connaissance du monde externe' (2), 'Idéalisme et Réalisme—Le principe de l' Inconcevable' (3), 'Le Réalisme transfiguré' (6) ; 'La question de la certitude' (4, 6). W. James (Cambridge, Mass.)—'Quelques considerations sur la méthode subjective'.

Zeitschrift für Philosophie, &c.—Bd. LXXII., Heft 1. G. F. Rettig—'Ueber *αἰτία* im *Philebus*'. Th. v. Varnbüler—'Exacte Begründung der absoluten Philosophie' (III.). E. Dreher—'Zum Verständniss der Sinneswahrnehmungen (II.). F. v. Bärenbach—'Das *Ding an sich* als kritischer Grenzbegriff'. R. Schellwien—'Zur Genesis u. Kritik der Erkenntnisslehre. H. Ulrici—'In Sachen der wissenschaftlichen Philosophie'. Recensionen. Bibliographie.

Philosophische Monatshefte.—Bd. XIII. Heft 9. H. Jacobi—'Die Gottesidee in der indischen Philosophie'. Recensionen u. Anzeigen (v. Hertling, *Uber die Grenze der mechanischen Welterklärung ;* Schmidt, *Leibniz u. Baumgarten ;* Kischner, *Leibniz' Psychologie u. G. W. Leibniz ;* Noack, *Philosophie-geschichtliches Lexikon, &c.*). Bibliographie. Phil. Vorlesungen an den deutschen Hochschulen im Wintersemester 1877-8. Heft 10. K. Böhm—'Zur Theorie des Gedächtnisses u. der Erinnerung.' O. Liebmann—'In Sachen der Psychophysik'. Zur Spinoza-Literatur : Zehn Schriften von u. über S., angezeigt von C. Schaarschmidt. Bibliographie, &c. Bd. XIV. Hefte 1, 2. C. Schaarschmidt—'Vom rechten u. vom falschen Kriticismus'. C. Stumpf—'Aus der vierten Dimension'. R. Eucken—'Untersuchungen zur Gesch. der ältern deutschen Philosophie, (I.) Johann Kepler'. Recensionen u. Anzeigen (Grote, *Moral Ideals ;* Caspari, *Grundprobleme der Erkenntnissthätigkeit ;* Knauer, *Der Himmel des Glaubens* ; Spencer, *Principien der Biologie ;* Rosenkranz, *Neue Studien*, Bd. III., &c.). Bibliographie, &c.

Vierteljahrschrift für wissenschaftliche Philosophie.—Bd. II. Heft 2. W. Wundt—'Ueber den gegenwärtigen Zustand der Thierpsychologie'. H. Siebeck—'Die metaphysischen Systeme in ihrem gemeinsamen Verhältnisse zur Erfahrung' (II. Schl.). H. Vaihinger—'Der Begriff des Absoluten (mit Rücksicht auf H. Spencer)'. H. Weissenborn—'Ueber die neuern Ansichten vom Raum und von den geometrischen Axiomen' (I.). Recensionen. Selbstanzeigen.

Erratum in No. IX. P. 36 l. 36—*for* implicitly *read* explicitly.

No. 11.] [July, 1878.

MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

I.—CONSCIOUSNESS OF TIME.

It is indisputable that our consciousness of the passage of time is determined by our consciousness of the sequence of events. We have only to reflect on the oblivion to time which is one characteristic of profound sleep, or of the total unconsciousness of its passage that occurs during coma, to perceive that our appreciation of time is nothing more than a mental abstraction of the sequence-relations among the events which have been presented to consciousness during the interval contemplated. Indeed this truth is so obvious that it has hitherto prevented psychologists from making any further analysis of our time-consciousness. Having explained its essential character, there seems at first sight no reason for further enquiry, and therefore, so far as I am aware, no one has ever waited to ascertain whether this explanation is complete, in the sense of leaving nothing further to be explained. But I think that a few moments' reflection will show that we are far from having explained all the facts of our time-consciousness when we refer them to the general principle above stated. For, granting that our time-consciousness is a mental abstraction of the sequence-relations among events, the question immediately arises, Are the events which by their sequence determine our time-consciousness all of equivalent value in so doing? In other words, is it only the quality of number that gives to these events their time-measuring property, or are there likewise other qualities in these events which may give them as time-measures a differential value? Now, if number is the only quality whereby successive events determine our appreciation of the passage of time, it is evident that there is no need for further analysis in the psychology of time-consciousness, for in this case time-consciousness would merely be a mental abstraction of the number of events which by their sequence generated our time-consciousness of the interval during which they were taking place. But, on the other hand, if number is not the only quality whereby successive events determine our appreciation of time, it is evident that an interesting question for psychological analysis is opened up; for in this case it remains to ascertain the other quality or qualities in successive events to which their differential value as time-measurers is due. Let us then, in the first place, interrogate consciousness with the view of ascertaining whether it is number alone that gives to successive events their property of generating in consciousness our appreciation of time.

Almost as soon as this question is carefully put, consciousness replies that the mere number of successive events is certainly not the only factor in determining their influence on our estimate of the time during which they were taking place. We have but to reflect on the extraordinary discrepancies in our estimate of time when we compare such experiences as the following. Suppose we have to row or to run a race concerning the result of which we are anxious, how great a contrast there is between the apparent duration of the five minutes before the start—which seem like an hour—and the five minutes during which we are actively engaged in the race. The same incredible discrepancy in our estimate of time is observable shortly before and shortly after the commencement of a competitive examination, or even of a public lecture. Again, how different is our estimate of time when we take a solitary "constitutional" walk, and when we return over the same ground with an intellectual companion. And, to give only one other instance, how interminable the time seems while we are waiting an hour or two at a country railway station, as compared with a similar interval after we have met a friend in the train and are passing through novel and beautiful scenery. Now in all these cases—and scores of others might be added—it is the interval during which there is a comparative *absence* of events that appears so protracted, while the similar interval which immediately succeeds it, and which by comparison appears so brief, is an interval which is crowded with striking events, or a succession of vivid states of consciousness. Thus I think there can be no question that it is not number alone that gives to successive events in consciousness their character of time-measurers. But, before proceeding to a further analysis, it is desirable to be a little more explicit about the term "successive events." All that can be properly denoted by this term as above used is successive states of consciousness, and it is in this sense that I shall use the term throughout. This being understood, it may be objected to the above illustrations that as consciousness can only exist in virtue of a perpetual change of states, it is really inaccurate to speak of a greater *number* of such changes taking place in any given interval of time than in any other interval of equal duration. Into this question, however, it is not necessary to go, because even if the point were conceded that in equal intervals of time consciousness undergoes equal numbers of changes, it would only tend to emphasise my statement, *viz.*, that as equal intervals of time may appear to be of very different durations, the mere *number* of the changes of our states of consciousness during the intervals compared cannot be the only factor in determining our appreciation of their respective lengths. This latter position then being now established, the problem which we have to solve is merely this—What other qualities besides that of the number of their changes give to states of consciousness their value as time-measurers? From the examples above cited, there would at first sight appear to emerge the very paradoxical inference, that the more vivid the states of consciousness, and the more abrupt their changes, the less is their value as time-measurers. This would be a very paradoxical inference, because, if the consciousness of time is determined by the number of changes in our states of consciousness, *à priori* we should expect that the more decided these changes are, and the consequently deeper impression which in memory they leave of their occurrence, the greater would be their value as time-measurers. But there is, I think, a road of escape from this paradoxical inference; and, as in all such cases, this road consists in the recognition of an additional cause. Before stating this additional cause, however, I should like to show that if examples are chosen in which its disturbing influence is absent, the *à priori* expectation above mentioned is found to be realised. Thus, for instance, it is a familiar observation that in childhood the years seem of much longer duration than in manhood; and the reason of this I take to be that, life being new to children, they derive strong impressions from numberless events which produce no such impressions in adults. Again, a day's railway travelling in a new country appears of longer duration than a day which is employed in our ordinary avocations, and especially so to persons who are not accustomed to railway travelling. And this is doubtless due to the comparatively novel order of changes in our states of consciousness which a day's railway travelling entails. Similarly I have often heard persons who habitually live in the country remark that a day spent in London sight-seeing appears to them very protracted. And numberless other instances might be given to show that when the disturbing cause which I am about to consider is absent, a long series of abrupt changes among vivid states of consciousness has, as we should expect, a greater value in generating time-consciousness than has a similar series of slight changes among comparatively faint states of consciousness.

I will now proceed to state what I conceive to be the disturbing cause which in numberless cases gives rise to what I may term abnormal time-consciousness as its effect. Every scientific experimenter must be able to recall instances in which it was necessary for him to note the passage of successive seconds during a greater or less interval of time; and, if so, he can scarcely fail to remember how interminably long such an interval appeared. But if any one who reads this paper should not have had any actual experience of this kind, it will be very easy for him to make a trial, by laying his watch on the table and resolving to keep his whole attention fixed on the movements of the minute hand for an interval of five or ten minutes, without allowing any other thoughts to enter his mind; the time will then appear to him incredibly long. Now, why should this be? for it is evident that in such a case there are no *vivid* or *abrupt* changes of conscious states; on the contrary, the experiment is marked by the strenuous endeavour to prevent any such changes. The answer I believe to be, that such changes of consciousness as occur under these circumstances all belong to one class—*viz.*, those which have reference to their own sequence, or, in other words, to the passage of time.* And this I hold to be the disturbing cause of which we are in search: in whatever degree states of consciousness have reference to their own sequence, in that degree is their value as time-measurers enhanced. At all events, in my own case I have invariably found this formula to apply; and I cannot but think that psychologists will find on enquiry that it is a general principle. *Why* it should be so I can scarcely venture to explain, unless it is that time-consciousness, being nothing more than the memory of a series of successive changes in consciousness, when the attention is particularly directed to the occurrence of such changes, so that these changes themselves form the whole content of consciousness, the fact of their sequence-relation is more indelibly impressed on memory; and thus on taking a retrospective estimate of their number we greatly exaggerate it. But, however this may be, I am pretty sure of the fact, that our time-consciousness is made up of two factors, which are in a large measure complementary to one another. For, our appreciation of time being nothing more than our generalised recollection of the number of changes which have taken place in our states of consciousness, one of the factors determining our appreciation of time I hold to be the *vividness* of the conscious states and the *abruptness* of their changes, which cause them to stand out prominently in our retrospective survey; and the other factor I hold to be the degree in which the states of consciousness have had reference to their own sequence, which has the effect of engendering in consciousness a disproportionate estimate of the number of their sequence-relations.

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* It will conduce to clearness in what follows if I speak of the contemplation of the passage of time as a reference by consciousness to the sequence of its own states. But in thus speaking I would not, of course, be understood to mean that the reference thus made by consciousness is made *consciously*. Our cognisance of the passage of time is determined by our taking a retrospect of the changes in our states of consciousness which have occurred between two points of the linear series. As each change occurs, it leaves behind it in memory a faint record of its occurrence, and it is the sum-total of these records in memory which enable us to take cognisance of time. Consequently, when our attention is fixed upon the passage of time as itself the subject of contemplation, although we are not consciously, or knowingly, contemplating these subjective sequence-changes which determine our cognisance of the passage of time, it must nevertheless be due to their occurrence that the time on which our attention is fixed is appreciated. Therefore, when our attention is fixed upon the passage of time, consciousness may properly be said to be engaged in an act of introspection.

It is needless to dwell on the operation of the first of these two factors, because, as before stated, this is the factor which all psychologists will be prepared to concede as obvious. But with regard to the other factor I may offer a few general remarks. In the first place, I believe it is owing to this factor that *observation*, as distinguished from *action*, makes time seem long. For during action consciousness is largely occupied with effecting whatever adaptations—psychical or mechanical—we may happen to be engaged upon; while during observation consciousness is free to contemplate, with a much more undivided attention, the sequence-relations of whatever phenomena we may happen to be observing. Hence, notwithstanding that during a period of activity we are usually subject to more intense and abrupt changes in our states of consciousness than we are during a period of passively observing, and notwithstanding that on this account the more obvious factor of our time-consciousness must be more intensely operative in the former than it is in the latter case, nevertheless, it is in the latter case that time seems longest, because the less obvious factor of our time-consciousness is here more intensely operative than it is in the former case. So that our estimate of time during a period of action or of observation respectively would seem to be determined by the proportional value of the two complementary factors of our time-consciousness.

As another general example of the action of the less obvious factor, I may allude to a circumstance which I think will scarcely be disputed, *viz.*, that in all cases where we "look forward" to the passage of a given interval of time, and so unduly occupy consciousness with the sequence-relations among its own states, the given interval seems to vary inversely as the degree of our desire for it to terminate—that is, as the earnestness with which our attention is fixed on the passage of time. A good example of this quantitative relation is to be found in our experiences while railway-travelling; for, however long the journey may be, the latter portion of it seems more tedious than the former; so that, for instance, if the journey is of two hours' duration, the last hour seems longer than the first one, but if the journey is of twelve hours' duration the second hour seems no longer than the first one, while the twelfth hour seems very protracted. Now the explanation of this I believe to be, that as the end of our journey approaches we "look forward" to its termination more persistently than at any other time during its progress. And it is to be observed, as we should expect, that it makes little or no difference whether our desire for the rapid passage of time is determined by the anticipation of an agreeable or of a disagreeable event; waiting for the arrival of a very dear friend who has been absent for a long time, for instance, seeming quite as remarkable, in the respects we are considering, as waiting for an examination. Moreover, it is to be further observed, as we should also expect, that the element of *definiteness* in the time which we have to wait makes a great difference in our estimate of its duration. For instance, I have several times observed that if I know there is an hour to wait for a train, the time seems much longer than if I have to wait an hour for a train which is overdue, and the approach of which—there being no telegraphic communication—the officials are momentarily expecting. And this difference is easily explained, if we reflect that in the former case there is no occupation for consciousness in the direction of hope; whereas in the latter case the consciousness of the passage of time is partly obliterated by the continuous state of expectation from moment to moment which to a large extent monopolises consciousness. And, lastly, there is still one other point to be observed, *viz.*, that on taking a retrospect of a given interval of time, it occasionally happens that it may be made alternately to look longer or shorter, according as we contemplate it in relation to one class or to another class of ideas which we experienced during that interval. Thus, if a man takes a retrospect of the interval of time during which he has been harrassed by a law-suit, it may appear longer when contemplated in relation to the suit than if contemplated in relation to other more agreeable events which transpired during the same period. And I believe the explanation of this to be that, by his recollection of the law-suit, he recalls by association a massive body of ideas, all of which were more or less intimately associated with his previous desire for the rapid termination of the suit; while in the case of the more agreeable events his associations have no reference to any such time-elements.

In conclusion, if this analysis is correct, a question arises as to the relative values of the two factors of our time-consciousness. Now, without pretending to answer this question with any degree of precision, I think it is evident that the factor which I have called the reference of states of consciousness to their own sequence, is, or admits of becoming, a much more important factor—at any rate, for short intervals of time—than the complementary factor which depends on the vivid character of the states of consciousness and the abrupt character of their changes. Thus, for instance, an exciting series of events, though they tend by their exciting character to make the time during which they occur seem slightly longer than a similar interval of time spent in a somewhat less exciting way, nevertheless do not make it seem so long as the same interval of time spent in a condition of *ennui*. For while the exciting character of the events completely excludes all inversion of consciousness upon its own sequence-changes, the state of *ennui* consists in such an inversion of consciousness whereby we are rendered perpetually, though vaguely, cognisant of subjective sequence-changes. Thus it would seem that when the contemplation of such subjective sequence-changes is completely shut out from consciousness, even though these changes are replaced by the most vivid changes of another order, our consciousness of the passage of time is not so marked as it is in the presence of such contemplation; and hence the apparently rapid passage of time during interesting work or exciting action, as compared with the *langweilig* character of *ennui*. To "kill time" is merely to transfer our states of consciousness from reference to their own sequence, to a reference of some other kind, *however interesting or exciting.**

George J. Romanes.

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* Certain narcotic drugs, such as the extract of Indian hemp, when taken in sufficient amount to cause dreaming, are said to make time appear enormously long. This effect is doubtless due to the stimulating action of the drug causing an unusual number of vivid changes in the states of conscious-

II—EDUCATION AS A SCIENCE. (III.)*

In Education, there has to be encountered at every turn the play of Motives. Now the theory of Motives is the theory of Sensation, Emotion and Will; in other words, it is the psychology of the Sensitive and the Active Powers.

THE SENSES.

The pleasures, the pains and the privations of the Senses are the earliest and the most unfailing, if not also the strongest, of motives. Besides their bearings on self-preservation, they are a principal standing dish in life's feast.

It is when the Senses are looked at on the side of feeling, or as pleasure and pain, that the defectiveness of the current classification into five is most evident. For, although, in the point of view of knowledge or intellect, the five senses are the really important approaches to the mind, yet, in the view of feeling or pleasure and pain, the omission of the varied organic susceptibility leaves a wide gap in the handling of the subject. Some of our very strongest pleasures and pains grow out of the region of organic life—the Digestion, Circulation, Respiration, Muscular and Nervous integrity or derangement.

In exerting influence over human beings this department of sensibility is a first resource. It can be counted on with more certainty than perhaps any other. Indeed, almost all the punishments of a purely physical kind fall within the domain of the organic sensations. What is it that makes punishment formidable, but its threatening the very vitals of the system? It is the lower degree of what, in a higher degree, takes away life.

ness; for on recovery the intoxicated person is said often to remember having imagined a vast number and variety of successive experiences. This distorted appreciation of the passage of time, owing to increased activity of cerebral action, may, I think, be instructively contrasted with the extraordinary accuracy of such appreciation which is displayed by some idiots. Here we have exactly the opposite mental condition to that which is produced by Indian hemp, &c.; for among idiots of a low type there is not much variation in the degree of their mental activity at different times, and as the stream of their consciousness is thus always more or less on a dead level, an act of retrospection affords a more trustworthy measure of time than it does in the case of an individual whose intellectual life is of a more varied character. Dr. Langdon Down tells me that those of his patients who display the faculty of "guessing the time" in a marked degree, are so little prone to conscious mental effort that in order to insure a correct answer they have to be first aroused to reflect by shaking. This fact shows on how dead a level their conscious life must be—thus allowing no opportunity for the occurrence of great variations in either of the factors of time-consciousness. And probably the same explanation applies to the accurate appreciation of time which is displayed by certain animals.

* Continued from Mind, No. VI.

For example, the Muscular System is the seat of a mass of sensibility, pleasurable and painful: the pleasures of healthy exercise, the pains of privation of exercise, and the pains of extreme fatigue. In early life, when all the muscles, as well as the senses, are fresh, the muscular organs are very largely connected both with enjoyment and with suffering. To accord full scope to the activity of the fresh organs is a gratification that may take the form of a rich reward; to refuse this scope is the infliction of misery; to compel exercise beyond the limits of the powers is still greater misery. Our penal discipline adopts the two forms of pain: in the milder treatment of the young, the irksomeness of restraint; in the severe methods with the full-grown, the torture of fatigue.

Again the Nervous System is subject to organic depression; and certain of our pains are due to this cause. The well known state denominated 'Tedium' is nervous uneasiness; and is caused by undue exercise of any portion of the nervous system. In its extreme forms, it is intolerable wretchedness. It is the suffering caused by penal impositions or tasks, by confinement, and by monotony of all kinds. The acute sufferings of the nervous system, as growing out of natural causes, are represented by neuralgic pains. It is in graduated artificial inflictions operating directly on the nerves by means of electricity that we may look for the physical punishments of the future, that are to displace floggings and muscular torture.

The interests of Nourishment, as against privation of food, are necessarily bound up with a large volume of enjoyment and suffering. Starvation, deficiency and inferiority of food, are connected with depression and misery of the severest kind; inspiring the dread that most effectually stimulates human beings to work, to beg, or to steal. The obverse condition of a rich and abundant diet is in itself an almost sufficient basis of enjoyment. The play of motives between those extremes enables us to put forth an extensive sway over human conduct.

An instructive distinction may be made between Privation and Hunger; likewise between their opposites. Privation is the positive deficiency of nourishing material in the blood; Hunger is the craving of the stomach at its usual times of being supplied, and is a local sensibility, perhaps very acute, but not marked by the profound wretchedness of inanition. There may be plenty of material to go on with, although we are suffering from stomachic hunger. Punishing, for once, by the loss of a meal out of the three or four in the day is unimportant as regards the general vigour, yet very telling as a motive. Absolutely to diminish the available nutriment of the system is a measure of great severity; to inflict a pending hunger is not the same thing.

When we unite the acute pleasures of the palate with stomachic relish and the exhilaration of abundance of food material in a healthy frame, we count up a large mass of pleasurable sensibility. Between the lowest demands of subsistence, and the highest luxuries of affluent means, there is a great range, available as an instrumentality of control in the discipline of the young. The usual regimen being something considerably above necessaries, and yet beneath the highest pitch of indulgence, room is given to operate both by reduction and by increase of luxury, without either mischief or pampering; and the sensibility in early years being very keen in those heads, the motive power is great. Having in view the necessities of discipline with the young, the habitual regimen in food should be pitched neither too low, nor too high to permit of such variations. It is the misfortune of poverty that this means of influence is greatly wanting; the next lower depth to the delinquent child is the application of the stick.

These are the chief departments of Organic Sensibility that contain the motives made use of in reward and punishment. The inflictions of caning and flogging operate upon the organ of the sense of touch, yet, in reality, the effect is one to be classed among the pains of organic life, rather than among tactile sensations; it is a pain resulting from injury or violence to the tissue in the first instance, and if carried far is destructive of life. Like all physical acute pains it is a powerful deterring influence, and is doubtless the favourite punishment of every age and every race of mankind. The limitations to its use demand a rigorous handling; but the consideration of these is mixed up with motives afterwards to be adverted to.

The ordinary five Senses contain, in addition to their intellectual functions, many considerable sensibilities to pleasure and pain. The pleasures can be largely made use of as incentives to conduct. The pains might of course be also employed in the same way; but with the exceptions already indicated they very rarely are. We do not punish by bad odours, nor by bitter tastes. Harsh and grating sounds may be very torturing, but they are not used in discipline. The pains of sight reach the highest acuteness, but as punishment they are found only in the most barbarous codes.

Postponing a review of the principles of punishment generally, we approach the most perplexing department of motives—the higher Emotions. Few of the simple sensational effects are obtained in purity, that is, without the intermingling of emotions.

THE EMOTIONS.

One large department of Psychology is made up of the classification, definition, and analysis of the Emotions. The applications of a complete theory of Emotion are numerous, and the systematic expansion must be such as to cope with all these applications. We here narrow the subject to what is indispensable for the play of motives in Education.

First of all, it is necessary to take note of the large region of Sociability, comprising the social emotions and affections. Next is the department of Anti-social feeling—Anger, Malevolence, and Lust of Domination. Taking both the sources and the ramifications of these two leading groups, we cover perhaps three fourths of all the sensibility that rises above the senses proper. They do not indeed exhaust the fountains of emotion, but they leave no others that can rank as of first-class importance, except through derivation from them and the Senses together.

The region of Fine Art comprises a large compass of pleasurable feeling, with corresponding susceptibilities to pain; some of this is sensation proper, being the pleasures of the two higher senses; some is due to associations with the interests of all the senses (Beauty of Utility); a certain portion may be called intellectual, the perception of unity in variety; whilst the still largest share appears to be derived from the two great sources above described.

The Intellect generally is a source of various gratifications and also of sufferings that are necessarily mixed up with our intellectual education. Both the delights of attained knowledge, and the pains of intellectual labour have to be carefully counted with by every instructor.

The pleasures of Action or Activity are a class greatly pressed into the educational service, and therefore demand special consideration.

The names Self-esteem, Pride, Vanity, Love of Praise, express powerful sentiments, whose analysis is attended with much subtlety. They are largely appealed to by everyone that has to exercise control over human beings. To gratify them is to impart copious pleasure, to thwart or wound them is to inflict corresponding pain.

Mention has not yet been made of one genus of emotion, formidable as a source of pain, and as a motive to activity, namely, Fear or Terror. Only in the shape of re-action or relief is it a source of pleasure. The skilful management of this sensibility has much to do with the efficient control of all sentient creatures, and still more with the saving of gratuitous misery.

Our rapid review of these various sources of emotion, together with others of a minor kind, proposes to deal once for all, and in the best manner, with the various educational questions that turn upon the operation of motives. We shall have to remark upon prevailing exaggerations on some heads, and the insufficient stress laid on others; and shall endeavour to unfold in just proportions the entire compass of our emotional susceptibilities available for the purposes of the teacher.

The Emotion of Terror.

The state of mind named Terror or Fear is described shortly as a state of extreme misery and depression, prostrating the activity and causing exaggeration of ideas in whatever is related to it. It is an addition to pain pure and simple—the pain of a present infliction. It is roused by the foretaste or prospect of evil, especially if that is great in amount, and still more if it is of uncertain nature.

As far as Education is concerned, terror is an incident of the infliction of punishment. We may work by the motive of evil without producing the state of terror, as when the evil is slight and well defined; a small understood privation, a moderate dose of irksomeness, may be salutary and preventive, without any admixture of the quakings and misery of fear. A severe infliction in prospect will induce fear; the more so that the subject does not know how severe it is to be.

In the higher moral Education, the management of the passion of fear is of the greatest consequence. The evils of operating by means of it are so great that it should be reserved for the last resort. The waste of energy and the scattering of the thoughts are ruinous to the interests of mental progress. The one certain result is to paralyse and arrest action, or else to concentrate force in some single point, at the cost of general debility. The tyrant, working by terror, disarms rebelliousness, but fails to procure energetic service, while engendering hatred and preparing for his overthrow.

The worst of all modes and instruments of discipline is the employment of spiritual, ghostly, or superstitious terrors. Unless it were to scourge and thwart the greatest of criminals—the disturbers of the peace of mankind, hardly anything justifies the terrors of superstition. On a small scale, we know what it is to frighten children with ghosts; on a larger scale is the influence of religions dealing almost exclusively in the fear of another life.

Like the other gross passions, Terror admits of being refined upon and toned down, till it becomes simply a gentle stimulation; and the re-action more than makes up for the misery. The greatest efforts in this direction are found in the artistic handling of fear, as in the sympathetic fears of tragedy, and in the passing terrors of a well constructed plot. In the moral bearings of the emotions, its refined modes are shown in the fear of giving pain or offence to one that we love, respect, or venerate. There may be a considerable degree of the depressing element even in this situation; yet the effect is altogether wholesome and ennobling. All superiors should aspire to be feared in this manner.

Timidity, or susceptibility to fear, is one of the noted differences of character; and this difference is to be taken into account in discipline. The absence of general vigour, bodily and mental, is marked by timidity; and the state may also be the result of long bad usage, and of perverted views of the world. In the way of culture, or of high exertion in any form, little is to be expected from thoroughly timid natures; they can be easily governed, so far as concerns sins of commission, but their omissions are not equally remediable.

The conquest of superstitious fears is one of the grandest objects of education taken in its widest compass. It cannot be accomplished by any direct inculcation; it is one of the incidental and most beneficial results of the exact study of nature, in other words, science.

The Social Motives.

This is perhaps the most extensive and the least involved of all the emotional influences at work in Education.

The pleasures of Love, Affection, Mutual Regard, Sympathy, or Sociability, make up the foremost satisfaction of human life; and as such are a standing object of desire, pursuit, and fruition. Sociability is a wholly distinct fact from the prime supports of existence and the pleasures of the five senses, and is not, in my opinion, resolvable into those, however deeply we may analyse it, or however far back we may trace the historical evolution of the mind. Nevertheless, as the supports of life and the pure sense agreeables and exemptions, come to us in great part through the medium of fellow-beings, the value of the social regards receives from this cause an enormous augmentation, and, in the total, counts for one paramount object of human solicitude. It would appear strange if this motive could ever be overlooked by the educator, or by any one; yet there are theories and methods that treat it as of inferior account.

The vast aggregate of social feeling is made up of the intenser elements of sexual and parental love, and the select attachments in the way of friendship, together with the more diffused sentiments towards the masses of human beings. The motive power of the feelings in education may be well exemplified in the intense examples; we can see in these both the merits and defects of the social stimulus. The *Phædrus* of Plato is a remarkable ideal picture of the study of philosophy prompted by Eros, in the Grecian form of attachment. The ordinary love of the sexes, in our time, does not furnish many instances of the mutual striving after high culture; it may be left out of account in the theory of early education. We frequently find mothers applying to studies that they feel no personal attraction for, in order to assist in the progress of their children. This is much better than nothing; a secondary end may be the initiation and discovery of a taste that at last is self-subsisting.

The intense emotions, from the very fact of their intensity, are unsuited to the promptings of severe culture. The hardest studious work, the laying of foundations, should be over, before the flame of sexual and parental passion is kindled; when this is at its height the intellectual power is in abeyance, or else diverted from its regular course. The mutual influence of two lovers is not educative for want of the proper conditions. No doubt considerable efforts are inspired; but there is seldom sufficient elevation of view on the one side, or sufficient adaptability on the other, to make the mutual influence what Plato and the romancists conceive as possible. By very different and inferior compliances on both sides, the feeling may be kept alive; if more is wanted, it dies away.

The favourable conjunction for study and mental culture in general is friendship between two, or a small number, each naturally smitten with the love of knowledge for its own sake, and basing their attachment on that circumstance. A certain amount of mutual liking in other respects perfects the relationship; but the overpowering sensuous regards of the Platonic couple do not furnish the requisite soil for high culture. As a matter of fact, those attachments, as they existed in Greece, prompted to signal instances of self-devotion in the form of surrendering worldly goods and life itself; and this is the highest fruit that they have yielded in later times.

The remaining aspect of sociability—the influence of the general multitude—holds out the most powerful and permanent motive to conduct, and is largely felt in education. In the presence of an assembly the individual is roused, agitated, swayed; the thrill of numbers is electric; in whatever direction the influence tends, it is almost irresistible. Any effort made in the sight of a host is totally altered in character; and all impressions are very much deepened.

Having in view this ascendancy of numbers, we can make a step towards computing the efficacy of class teaching, public schools, and institutions where great multitudes are brought together. The power exercised is of a mixed character; and the several elements admit of being singled out. The social motive, in its pure form of gregarious attraction and mutual sympathy, does not stand alone. Supposing it did, the effect would be to supply a strong stimulus in favour of everything that was supported by common consent; the individual would be urged to attain the level of the mass. The drill of a regiment of soldiers corresponds very nearly to this situation; every man is under the eye of the whole, and aspires to be what the rest are, and not much, if anything, beyond: the sympathetic co-operation of the mass, guides, stimulates, and rewards the exertion of the individual. Even, if it were the destination of a soldier to act as an isolated individual, still his education would be most efficaciously conducted in the mass system; being finished off by a certain amount of separate exercise to prepare for the detached or independent position.

In every kind of education in classes, the social feeling, in the pure form now assumed, is frequently operative; and the results are as stated. The tendency is to secure a certain approved level of attainment: those that are disinclined of themselves to work up to that level are pushed on by the influence of the mass. If there were no other strong passions called out in society, the general result would be a kind of communism or socialism characterised by mediocrity and dead level; everything correct up to a certain point, but no individual superiority or distinction.

The influence of society as the dispenser of collective good and evil things, in addition to its operation in the affections and sympathies, is necessarily all-powerful in every direction. If this stimulus were always to coincide with high mental culture, the effect would be something that the imagination hardly dares to shadow forth. It is, however, a power that may be propitiated by many different means, including shams and evasions; and the bearing upon culture is only occasional. Nevertheless, the social rewards have often served to foster the highest genius—the oratory of Demosthenes, and the poetry of Horace and of Virgil—a form of genius notoriously allied with toil and perseverance of the most arduous kind. The same influence, working by disapprobation and approbation combined, is, as I contend, the principal generating source of the ordinary moral sentiments of mankind, and the inspiration of exceptional virtues.

The Anti-Social and Malign Emotions.

The emotions of Anger, Hatred, Antipathy, Rivalry, Contumely, have reference to other beings, no less than Love or Affection, but in an opposite way. In spite of the painful incidents in their manifestation—the offence in the first instance, and the dangers of reprisal—they are a source of immediate pleasure, often not inferior, and sometimes superior, in amount to the pleasures of amity and gregarious co-operation. In numerous instances, people are willing to forego social and sympathetic delights to indulge in the pleasures of malignity.

In the work of discipline the present class of emotions occasions much solicitude. They can in certain ways be turned to good account, but for the larger part the business of the educator and the moralist is to counterwork them as being fraught with unalloyed evil.

Being a fitful or explosive passion, Anger should, as far as possible, be checked or controlled in the young; but there are no adequate means, short of the very highest influence of the parent or teacher. The restraint induced by the presence of a dread superior at the time does not sink deep enough to make a habit; opportunities are sought and found to vent the passion with safety. The cultivation of the sympathies and affections is what alone copes with angry passion, both as a disturber of equanimity, and as the prompter of wrong. The obverse of ill-temper is the disposition that thinks less of harm done to self, and more of harm done to other people; and if we can do anything to foster this disposition, we reduce the sphere of malignant passion. The collateral incentives to suppress angry passion include, besides the universal remedy of disapprobation, an appeal to the sense of personal dignity and to the baneful consequences of passionate outbursts.

The worst form of malignant feeling is cold and deliberate delight in cruelty; all too frequent, especially in the young. The torturing of animals, of weak and defenceless human beings, is the spontaneous outflow of the perennial fountain of malevolence. This has to be checked, if need be, at the expense of considerable severity. The inflictions practised on those that are able to recriminate, generally find their own remedy; and the discipline of consequences is as effectual as any. By having to fight our equals, we are taught to regulate our wrathful and cruel propensities.

The intense pleasure of victory contains the sweetness of malevolence, heightened by some other ingredients. The prostration and destruction of an enemy or a rival is, no doubt, the primary situation where malevolent impulses had their rise; and it continues to be perhaps the very strongest stimulant of the human energies. Notwithstanding its several drawbacks, we are obliged to give it a place among motives to study and mental advancement. In the fight and struggle of party contests, the pleasure of victory enters in full flavour; and in the competitions at school, the same motive is at work.

The social problem of restraining individuals in their selfish grasping of good things—the mere agreeables and exemptions of the senses—is rendered still more intractable by the craving for the smack of malevolent gratification. Total repression has been found impossible; and ingenuity has devised a number of outlets that are more or less compatible with the sacredness of mutual rights.

One chief outlet for the malevolent impulses is the avenging of wrong, whether private or public. A convicted wrongdoer is punished by the law, and the indignation roused by the crime turns to gratification at the punishment. In the theory of penal retribution, some allowance is claimed for the vindictive satisfaction of the public. To think only of the prevention of crime and the reformation of criminals, and suppressing all resentful feeling, is a severe and ascetic view, beyond human nature as at present constituted. The privacy of the punishments of criminals, in our modern system, is intended to keep the indulgence within bounds.

A wide ideal scope is given to our resentful pleasures in history and in romance; we are gratified by the retribution inflicted upon the authors of wrong. Narratives of evil-doers and of their punishment are level to the meanest capacity; this is the sort of history that suits the imagination even of children.

The highest refinement of the malevolent gratification I take to be the emotion called the Ludicrous and the Comic. There is a laugh of vindictiveness, hatred, and derision, which carries the sentiment as far as it can be carried without blows. But there is also the laugh expressed by Playfulness and Humour, in which the malignant feeling seems almost on the point of disappearing in favour of the amicable sentiment. It is of some importance to understand that in play, fun, and humour, there is a delicate counterpoise of opposing sentiments, an attempt to make the most of both worlds—Love and Anger. The great masterpieces of humour in literature, the amenities of everyday society, the innocent joyousness of laughter—all attest the success of the hazardous combination. Nothing could better show the intensity of the primitive charm of malevolence, than the unction that survives after it is attenuated to the condition of innocent mirthfulness. When the real exercise of the destructive propensity is not to be had, creatures endowed with emotions still relish the fictitious forms. This is seen remarkably in the amicable 'play' of puppies and kittens. Not being endowed with much compass of the caressing acts, they show their love by snarling, and sham biting; in which, through their fortunate self-restraint, they seem to enjoy a double pleasure. In the play of children, there is the same employment of the forms of destructive malevolence, and so long as it is happily balanced, the effect is highly piquant. By submitting in turn to be victimised, a party of children can secure, at a moderate cost to each, the zest of the malevolent feeling; and this I take to be the quintessence of play.

The use of this close analysis is to fix attention upon the precarious tenure of all these enjoyments, and to render a precise reason for the well-known fact that play or fun is always on the eve of becoming earnest; in other words, the destructive or malevolent element is in constant danger of breaking loose from its checks, and of passing from fictitious to actual inflictions. The play of the canine and the feline kind often degenerates in this fashion; and in childish and youthful amusements it is a perpetual rock ahead.

It is no less dangerous to indulge people in too much ideal gratification of the vindictive sentiments. Tales of revenge against enemies are too apt to cultivate the malevolent propensity. Children, it is true, take up this theme with wonderful alacrity; nevertheless it is a species of pampering supplied to the worst emotions instead of the best.

One other bearing of Irascibility on Education needs to be touched. When disapproval is heightened with Anger, the dread inspired is much greater. The victim anticipates a more severe infliction when the angry passion has been roused; hence the supposition is natural, that anger is an aid to discipline. This, however, needs qualifying. Of course any increase of severity has a known deterrent effect, with whatever drawbacks may attend the excess. But anger is fitful; and, therefore, its co-operation mars discipline by want of measure, and want of consistency; when the fit has passed, the mind often relapses into a mood unfavourable to a proper amount of repression.

The function of anger in discipline may be something very grand, provided the passion can be controlled. There is a fine attitude of indignation against wrong that may be assumed with the best effect. It supposes the most perfect self-command, and is no more excited than seems befitting the occasion. Mankind would not be contented to see the bench of Justice occupied by a calculating machine that turned up a penalty of five pounds, or a month's imprisonment, when certain facts were dropped in at the hopper. A regulated expression of angry feeling is a force in itself. Neither containing fitfulness, nor conducting to excess of infliction, it is the awe-inspiring personation of Justice, and is often sufficient to quell insubordination.

The Emotion of Power.

The state named the feeling or emotion of Power expresses a first-class motive of the human mind. It is, however, shown, with great probability, not to be an independent source of emotion. It very often consists of a direct reference to possessions or worldly abundance. In other cases, I cannot doubt that the pleasure of malevolent infliction is an element; the love of domineering, or subjecting other people's wills, would be much less attractive than it is, if malevolent possibilities were wholly left out.

Power in the actual is given by bodily and mental superiority, by wealth, and by offices of command. Hence it can be enjoyed in any high degree only by a few. It is, however, capable of great ideal expansion; we can derive gratification from the contemplation of superior power, and the outlets for this are numerous, including not merely the operations of living beings, but the forces of inanimate nature. For example, the Sublime is an ideal of great might or power.

We have now almost, but not quite, led up to the much-urged educational motive, the gratification of the sense of self-activity in the pupils. This must afterwards undergo a very searching examination. Let us, however, first briefly review another leading class of well marked feelings, those designated by the familiar terms—Self-complacency, Pride, Vanity, Love of Applause. Whether these be simple or compound in their nature, they represent feelings of great intensity, and they are specially invoked in the sphere of education.

The Emotions of Self.

'Self' is a very wide word. 'Selfish,' 'Self-seeking,' 'Self-love,' might be employed without bringing any new emotions to the front. All the sources of pleasure, and all the exemptions from pain, that have been or might be enumerated, under the Senses and the Emotions, being totalised, could be designated as 'Self' or 'Self-interest'. But connected with the terms Self-esteem, Self-complacency, Pride, Vanity, Love of Praise, there are new varieties of feeling, albeit they are but offshoots from some of those already given. It is not our business to trace the precise derivation of these complex modes, except to aid in estimating their value as a distinct class of motives.

There is an undoubted pleasure in finding in ourselves some of those qualities that, seen in other men, call forth our love, admiration, reverence, or esteem. The names self-complacency, self-gratulation, self-esteem, indicate emotions of no little force. They have a good influence in promoting the attainment of excellence; their defect is ascribable to our enormous self-partiality: for which cause they are usually concealed from the jealous gaze of our fellows. It is only on very special occasions that persuasion is made to operate through these powerful feelings; they are too ready to turn round and make demands that cannot be complied with.

A still higher form of self-reflected sentiment is that designated by the Love of Praise and Admiration. We necessarily feel an enhanced delight when our own good opinion of self is echoed and sustained by the expressions of others. This is one of the most stirring influences that man can exert over man. It exists in many gradations, according to our love, regard, or admiration for the persons bestowing it, as well as our dependence upon them, and according to the number joining in the tribute.

The bestowal of praise is an act of justice to real merit, and should take place apart from ulterior considerations. But in rewarding, as in punishing, we cannot help looking beyond the present; we have in our eye merits that are yet to be achieved. The fame that attends intellectual eminence is an incentive to study, and the educator has this great instrument at his command.

Praise to be effectual and safe has to be carefully apportioned, so as to approve itself to all concerned. As the act of praising does not terminate with the moment, but establishes claims for the future, thoughtless profusion of compliment defeats itself. Praise may operate in the form of warm, kindly expression, and no more; in which sense it is an offering of affection, and has a value in that character alone. A pleased smile is a moral influence.

Discipline, properly so called, works in the direction of pain; pleasures are viewed in their painful obverse. The positive value of delights is of consequence as the starting-point wherefrom to count the efficacy of deprivations. The pains opposed to the pleasures of Self-esteem and Praise are among the most powerful weapons in the armoury of the disciplinarian. They are the chief reliance of such as deprecate corporal inflictions. Bentham's elaborate scheme of discipline in the *Chrestomathia* is a manipulation of the motives of Praise and Dispraise, which he would fain make us believe to be all-sufficient.

Of the two divisions of the present class of emotions, namely, Self-Esteem on the one hand, and Desire of Praise on the other, the opposite of the first—Self-reproach, Self-humbling—is very little under foreign influence. To induce people to think meanly of themselves is no easy task; with the mass of human beings it is well-nigh hopeless. Any success that attends the endeavour is an offshoot from the second member of the class under discussion, namely, Dispraise, Depreciation. There is no mistaking our aim here; we can make our power felt in this form, whether it has the other effect or not. People live so much on one another's good opinion that the remission tells in an instant;

from the simple abatement or loss of estimation there is a descent into the depths of disesteem with a result of unspeakable suffering. The efforts that the victim makes to right himself under censure only shows how keenly it is felt. There can be little doubt that on the delicate handling of this instrument must depend the highest refinements of moral control.

The Emotions of Intellect.

The pleasurable emotions incident to the exercise of the Intellectual Powers have not the formidable magnitude that we have assigned to the foregoing groups. Indeed, on the occasions when they seem to burst forth with an intense glow, we can discern the presence of emanations from these other great fountains of feeling.

It is an effort of prime importance to trace exhaustively the inducements and allurements to intellectual exertion. What are the intrinsic charms of knowledge, whether in pursuit or in possession? The difficulty of the answer is increased rather than diminished by the flow of fifty years' rhetoric.

Knowledge has such a wide compass, embraces such various ingredients, that until we discriminate the kinds of it, we cannot speak precisely either of its charms or of its absence of charm. Some sorts of knowledge are interesting to every body; some interest only a few. The serious part of the case is that the most valuable kinds of knowledge are often the least interesting.

The important distinction to be drawn here is between Individual or Concrete Knowledge, and General or Abstract Knowledge. As a rule, particulars are interesting as well as easy; generals uninteresting and hard. When particulars are not interesting, it is often from their being overshadowed by generals. When generals are made interesting, it is by a happy reflected influence upon the particulars. It would serve nearly all the purposes of the teacher to know the best means of overcoming the repugnance and the abstruseness of general knowledge.

Waiving for a time the niceties of the abstract idea, and the obstacles in the way of its being readily comprehended, we may here adduce certain motives that co-operate with the teacher's endeavours to impress it. A little attention, however, must first be given to the various kinds of interest that pertain to Individual or particular facts.

Any kind of knowledge, whether particular or more or less general, that is obviously involved in any of the strong feelings or emotions that we have passed in review, is by that very fact interesting. Now a great many kinds of knowledge are implicated with those various feelings. To avoid pains, and obtain pleasures, it is often necessary to know certain things, and we willingly apply our minds to learn those things; and the more so, the more evident their bearing upon the gratification of our desires. A vast quantity of information respecting the world, and respecting human beings, is gained in this way; and it constitutes an important basis of even the highest acquisitions.

The readiness to imbibe this immediately fructifying knowledge is qualified by its being difficult or abstruse; we often prefer ignorance, even in matters of consequence, to intellectual labour.

All the natural objects that bear upon our subsistence, our wants, our pleasures, our exemptions from pain, are individually interesting to us, and become known in respect of their special efficacy. Our food, and all the means of procuring it, our clothing and shelter, our means of protection, our sense-stimulants, are studied with avidity, and remembered with ease. This department of knowledge, notwithstanding its vital concern, is apt to be considered as grovelling; it has, however, the recommendation of truth. We do not encourage ourselves in any deceptions in such matters; and, if we make mistakes, it is owing to the obscurity of the case, rather than to our indifference, or to any motive for perverting the facts. Indeed, this is the department that first supplied to mankind the best criterion of certainty.

There is a different class of objects that appeal, not to the more pressing utilities of subsistence, safety, and comfort, but to the gratifications of the higher senses and the emotions; the pleasures of touch, sight and hearing; the social and antisocial emotions. These comprise all the more striking objects of the world:—the sun and celestial sphere, the earth's gay colouring, and sublime vastness; the innumerable objects, inanimate and animate, that tickle some sense or emotion. In proportion as human beings are set free from the struggle for subsistence, do they lay themselves open to these influences, and so enlarge the sphere of natural knowledge. Individual things become interesting and known from inspiring these feelings.. The culminating interest, however, is in living beings, and especially persons of our own species. The intellectual impressions thus left upon us are lively, but not necessarily correct to the facts.

However all this may be, it is to individual things that we must refer the first beginnings of knowledge, the interest and the facility of acquisition. There are great inequalities in this interest and consequent facility; many individual objects inspire no interest at all in the first instance; while some of these become interesting afterwards, in consequence of our discovering in them relationships to things of interest.

One notable distinction among the objects of knowledge is the distinction between movement or change, and stillness or inaction. It is movement that excites us most; still life is rendered interesting by reference to movement. We are aroused and engrossed by all moving things; our attention is turned away from objects at rest to contemplate movements; and we imbibe with great rapidity the impressions of moving objects.

This brief survey of the sphere of Individuality and of the various attractions presented by individuals is preparatory to the consideration of the most arduous part of knowledge—the knowledge of generals or Generality. All the difficulties of the higher knowledge have reference to the generalising process—the seeing of one in many. The arts of the teacher and the expositor are supremely requisite in sweetening the toil of this operation. At the present stage, however, the question is to assign the motives connected with general knowledge as distinct from individual knowledge.

General knowledge, represented by Science, consists in holding together, by a single grasp, whole classes of objects, of facts, of operations. This must, by the very nature of the case, be more severe than holding an individual. To form an idea of one tree that we have repeatedly surveyed at leisure round and round, is about the easiest exertion whether of attention or of memory. To form an idea of ten trees partly agreeing and partly differing among themselves, is manifestly an entirely altered task; it is to exchange comparative simplicity for arduous complexity; yet this is what is needed everywhere in the higher knowledge.

The first emotional effect attendant on the process of generalising facts, and serving to lighten the intellectual burden, is the flash of identity in diversity, an exhilarating charm that has been felt in every age by the searchers after truth. Many of the grandest discoveries in science have consisted, not in bringing to light any new individual fact, but in seeing a likeness between things formerly regarded as wholly unlike. Such was the great discovery of gravitation. The first flash of the recognition of a common power in the motions of the planets and the flight of a projectile on the earth was unutterably splendid; and after a hundred repetitions, the emotional charm is unexhausted.

With the emotion of exhilarating surprise at the discovery of likeness among things seemingly unlike, there is another grateful feeling—the relief from an intellectual burden. This appears at first sight a contradiction to what has been already said respecting the greater laboriousness of general knowledge: but the contrariety is only apparent. To contract an impression of one single individual, after plenty of time given to attend to it, is the easiest supposable mental effort. But such is the multiplicity of things, that we must learn to know, and remember, vast numbers of individuals; and, we soon feel ourselves overpowered by the never-ending demands upon us. We must know many persons, many places, many houses, many natural objects; and our capability of memory is in danger of exhaustion before we have done. Now comes in, however, the discovery of identities, whereby the work is shortened. If a new individual is exactly the same as the old, we are saved the labour of a new impression; if there is a slight difference, we have to learn that difference and no more. In actual experience, the case is that there are numerous agreements in the world, but accompanied with differences; and while we have the benefit of the agreements, we must take notice of the differences. What makes a general notion difficult is that it represents a large number of objects that, while agreeing in some respects, differ in others. This difficulty is the price that we pay for an enormous saving in intellectual labour.

The overcoming of isolation in the multitude of particulars, by flashes of identity, is the progress of our knowledge in one direction; it is the satisfaction that we express when we say we understand or can account for a thing. Lightning was accounted for when it was identified with the electric spark: besides the exhilarating surprise at the sameness of two facts in their nature so different and remote, men had the farther satisfaction of saying that they learned what lightning is. Thus by discoveries of identity we are enabled to explain the world, to assign the causes of things, to dissipate in part the mysteriousness that everywhere surrounds us.

When a discovery of identification is made among particulars hitherto looked upon as diverse, the interest created is all-sufficient to secure our appreciation. This is the alluring side of generalities. The repugnant aspect of them is seen in the technicalities that are invented to hold and express them—general or abstract designations, diagrams, and formulas. When it is proposed to indoctrinate the mind in these things, by themselves, and at a stage when the condensing and explaining power of the identities is as yet unawakened, the whole machinery seems an uncouth jargon. Hence the attempt to afford relief to the faculties by teaching the dry symbols of Arithmetic and Geometry through the aid of examples in the concrete, and in all the abstract sciences to afford plenty of particulars to illustrate the generalities. This is good so far; but the real interest that overcomes the dryness arises only when we can apply the generalities in tracing identities, in solving difficulties, and in shortening labour; an effect that comes soonest to those that have already some familiarity with the field where the formulas are applicable. The liking for Algebra and for Geometry proceeds apace when one sees the marvels of curious problems solved, unlikely properties discovered, among numbers and geometrical figures. A certain ease in holding in the memory the abstract symbols, after a moderate application, is enough to prepare us for a positive relish in the pursuit. Such is the case with generalities in all departments. If we can hold on till they bear their fruits in the explanation of things that we have already begun to take notice of, the pursuit is sustained by a genuine and proper scientific interest, whose real groundwork, however, deeply hidden, is the stimulus of agreement among differing particulars, and the lightening of the intellectual labour in comprehending the world. These are the feelings that have to be awakened in the minds of pupils when groaning under the burden of abstractions.

The opposition of the Concrete and the Abstract, while but another way of expressing the opposition of the Particular and the General, brings into greater prominence the highly *composite* or combined character of Individuality. The individual thing is usually a compound of many qualities, each of which has to be abstracted in turn, in rising to general notions; any individual ball has, in addition to its round form, the properties called weight, hardness, colour, and so on. Now this composite nature, by charming several senses at once, gives a greater interest to individuals, and urges us resist that process of decomposition, and separate attention, to which are given, the designations, 'abstraction' and 'analysis'. It is for individuals in all their multiplicity of influence that we contract likings or affections; and according as the charm of sense, and especially the colour sense, is strong in us, we are averse to the classing or generalising operation. A fire is an object of strong individual interest: to rise from this to the general notion of the oxidation of carbon under all varieties of mode, including cases with no intrinsic charm, is to quit with reluctance an agreeable contemplation. The emotions now described—the pleasure of identity, and the lightening of labour—are of avail to counterwork this reluctance.

The second of the two motives that we have coupled together—the easing of intellectual labour—may be viewed in another light. When objects are viewed as operating agents in the economy of the world, as causes or instruments of change, they work by their qualities or powers in separation, and not by their entire individuality or concreteness. An iron bar, or a poker, is an individual concrete thing; but when we come to use it, we put in action its various qualities separately. We may employ it as a weight; in which case its other properties are of no account: we use it as a lever, and bring into play simply its length and its tenacity. We can put it in motion as a moving power, wherein its inertia is alone taken into account, with perhaps its form. In all these instances, the magnetical and the chemical, and the medicinal properties of iron are unthought of. Now this consideration opens up an important aid to the abstracting process, the analytic separation of properties, as opposed to the mind's fondness for clinging to concrete individuality. When we are working out practical ends, we must follow nature's method of working; and as that is by isolating the separate qualities, we must perform the act of mental isolation, which is to abstract, or consider one power to the neglect of the rest. When we want to put forth heavy pressure, we think of various bodies solely as they can exert weight, however many other ways they may invite or charm our sense. This is to generalise or to form a general notion of weight; and the motive to conceive it, is practical need or necessity.

This motive of practical need at once brings us to the very core of Causation, viewed as a merely speculative notion. The cause of anything is the agent that would bring that thing into being, suppose we were in want of it. The cause of warmth in a room is combustion properly arranged; we use this fact for practical purposes, and we may also use it for satisfying mere curiosity. We enter a warm room; we may desire to know how it has been made warm, and we are satisfied by being told that there has been, or is now somewhere, a fire in communication with it.

Thus it is that in proportion as we come to operate upon the world practically ourselves, and from that proceed to contemplate causation at large, we are driven upon the abstracting and analysing process, so repugnant to one large portion of our feelings. Science finds an opening in our minds at this point, when otherwise we might need the proverbial surgical operation.

These observations will serve to illustrate the working of the emotion named Curiosity, which is justly held to be a great power in teaching. Curiosity expresses the emotions of knowledge viewed as desire; and more especially the desire to surmount an intellectual difficulty once felt. Genuine curiosity belongs to the stage of advanced and correct views of the world.

Much of the curiosity of children, and of others beside children, is a sham article. Frequently it is a mere display of egotism, the delight in giving trouble, in being pandered to and served. Questions are put, not from the desire of rational information, but for the love of excitement. Occasionally, the inquisitiveness of a child provides an opportunity for imparting a piece of real information; but far oftener not. By ingeniously circumventing a scientific fact, one not too high for a child's comprehension, we may awaken curiosity and succeed in impressing the fact. Try a child to lift a heavy weight first by the direct pull, and then by a lever or a set of pulleys, and probably you will excite some surprise and wonder, with a desire to know something farther about the instrumentality. But one fatal defect of the childish mind is the ascendancy of the personal or anthropomorphic conception of cause. This no doubt is favourable to the theological explanation of the world, but wholly unsuited to physical science. A child, if it had any curiosity at all, would like to know what makes the grass grow, the rain fall, the wind howl, and generally all things that are occasional and exceptional; an indifference being contracted towards what is familiar, constant, and regular. When anything goes wrong, the child has the wish to set it right, and is anxious to know what will answer the purpose; this is the inlet of practice, and, by this, correct knowledge may find its way to the mind, provided the power of comprehension is sufficiently matured. Still the radical obstacle remains—the impossibility of approaching science at random, or taking it in any order; we must begin at the proper beginning, and we may not always contrive to tickle the curiosity at the exact stage of the pupil's understanding. Every teacher knows or should know the little arts of giving a touch of wonder and mystery to a fact before the explanation is given; all which is found to tell in the regular march of exposition, but would be lost labour in any other course.

The very young, those that we are working upon by gentle allurement, are not properly competent to learn the 'how' or 'wherefore' of any important natural fact; they cannot even be made to desire the thing in the proper way. They are open chiefly to the charm of sense novelty and variety, which together with accidental charm or liking impresses the pictorial or concrete aspects of the world, whether quiescent or changing, the last being the most powerful. They farther are capable of understanding the more palpable conditions of many changes, without penetrating to ultimate causes. They learn that to light a fire there must be fuel and a light applied; that the growth of vegetables needs planting or sowing, together with rain and sunshine through a summer season. The empirical knowledge of the world that preceded science is still the knowledge that the child passes through in the way to science; and all this may be guided so as to prepare for the future scientific revelations. In other respects, the so-called curiosity of children is chiefly valuable as yielding ludicrous situations for our comic literature.

A. Bain.

III.—THE ORIGIN OF THE SUBLIME.

THERE is perhaps no feeling in our nature more strangely compounded and more indefinably singular than that which we call the Sense of the Sublime. It is not exactly pleasurable, and yet it certainly is not painful. It has many elements in common with fear, many in common with reverence, and not a few in common with beauty. Yet it stands apart from all three, in an isolated corner of its own, and it has seldom received any fitting attention at the hands of scientific psychologists. Most writers have classed it roughly amongst the æsthetic feelings, but hardly, I think, with sufficient reason. Perhaps an analysis of its origin in the human mind will lead us to a truer notion of its nature and functions.

If we go back to the very first germ from which the feeling of the Sublime has been developed, we must seek it lower down in the animal scale than the limits of humanity itself. The desire to produce an *effect* is one which man shares with many of the higher vertebrates. If we watch monkeys at play, we shall notice how keenly they enjoy the power of startling or surprising their fellows. They love to pull one another's ears unexpectedly, to jump on a sudden from a height, or to make a smaller comrade squeak aloud with pain. Dogs are equally anxious to obtain notice by jumping over a stick, or exhibiting their skill in tricks. Many animals evidently delight in the loudness of their own roar or cry, while still more strut proudly about in the triumph of victory over their rivals. In many ways birds and mammals show us that they understand and appreciate the simpler pleasures of power and display. And as all power is an index of success in the struggle for life, this feeling is clearly conducive to the preservation of individuals or races in whom it exists, and consequently is continually strengthened under the selective action of survival of the fittest.

When we come to the younger members of our own species, we find similar feelings more developed, and more highly evolved. Babies in arms will crow with delight at knocking down a tea-cup, or making a loud noise. Schoolboys enjoy nothing so much as a crash or bang—they are perfectly happy with an ounce of gunpowder or half-a-dozen squibs; and they delight in rolling big stones down hillsides, or driving horses and cows full-pelt across a meadow. An exhibition of *what they can do* is their greatest pleasure: and this feeling, again, is clearly one which contributes greatly to the success in life of those races which possess it.

Hence arise two or three important impulses, which pave the way for the sense of Sublimity. One very conspicuous method of proving one's prowess is by the performance of deeds requiring strength and skill. Every savage is proud of his warlike achievements, and is urged on by the admiration of his fellows. This admiration itself has a double origin: it is partly selfish, depending upon the fact that a strong and brave man is a shield and buckler to every member of his tribe; and it is partly sympathetic, in an incipient degree, depending upon the consciousness of self-approval for similar qualities in one's own case. The earliest embryo of the Sublime is doubtless to be sought in this savage appreciation for the brave warrior of one's tribe. The man whose strong arm comes in to save one from the club of one's foe, deserves lasting gratitude and admiration. The hero who leads the attack against the enemy, and successfully carries away cattle and wives, is an object of respectful awe. The Hector who alone wards off from his Troy a myriad of Myrmidons, demands the obeisance of cowards and women.

Probably this is the only form of the Sublime which is reached by the lowest types of humanity. We can hardly imagine the early races, who are still represented by Veddahs and Andamanese, admiring the vault of heaven or the foaming cataract, the lofty mountain or the angry sea. Yet even in this primitive germ, we see the main traits which mark the feeling of Sublimity in its highest flights. It is a mixture of love and dread. The savage knows the value to himself and his fellows of the strong warrior, and treats him accordingly with genuine respect; but he knows also how dangerous is his anger, and regards him consequently with awe and reverence. His feeling is very different from that with which he thinks of his enemy—there, hatred and fear are unqualified by that respect which is begotten from the hope of aid; but it is also very different from that with which a civilised man thinks of his friend—pure affection, unmixed with fear. Perhaps the nearest emotion within the range of our own experience is that which a child entertains towards his parents. In a crowd of strangers he clings to them as known friends, but he never forgets that they are also the dispensers of punishment, and keepers of the whip.

There are few societies of men in which the strongest has not come in time to occupy the post of chief or king. As this position strengthens and hardens down by custom, the feeling of awe and respect deepens. The absolute monarch, with power of life and death over every subject, is a natural object of dread. Yet he is also the leader of the host, the dispenser of favours, the divider of the spoil. If implicit obedience to his will is demanded of all, yet that obedience, when willingly granted, generally secures benefits for the subject. And as the tribe profits by its discipline and its military organisation, there will naturally grow up in all successful predatory tribes, an intense feeling of loyalty and reverence for the king—a loyalty culminating in that of the Fijians, who consider it an honour to become food for their chiefs. The second stage in the evolution of the Sublime is found in the veneration for the savage king.

But when the king dies, he does not utterly pass away.* A new king rises in his place, who was once his subject, and who, dreading him during his lifetime, now still more dreads and reverences his surviving ghost or double. The people too, who fear the new king, must still more fear the ghost which the king himself is afraid to displease. Yet their feeling is not wholly one of terror. The ghosts of enemies are indeed objects of unmitigated dread; but the king of their own people, though terrible as all ghosts are, nevertheless aids them in the fight, and drives away the evil spirits of the hostile tribe. He can be propitiated with gifts, and he is still the powerful if somewhat uncertain friend of his former subjects. As in life he was harsh yet invaluable, so in the spirit-world he is easily offended yet placable to his tribesmen, and their steadfast ally against all enemies, earthly or ghostly. And inasmuch as this feeling, too—by binding together the tribe, and adding a supernatural element of subordination to the natural one of kingship—increases its organisation, and strengthens its hands against aggressors, it, like the former ones, is perpetually developed and deepened through the natural selection of those societies which most display it. The third step in the evolution of the Sublime is the mixed feeling of fear and hope with which savages regard the earliest god, the ghost of their deified chieftain.

By this time the sense of Sublimity has reached a very considerable distinctness. It is true that it still confines itself to human or quasi-human attributes, and that the infinitely wider Sublimity of nature is as yet all but unperceived. We shall see hereafter how that conception is gradually developed through the anthropomorphic mode of envisaging the inanimate world which springs from the extension of the ghost-theory. For the present we may confine our attention to the expression of Sublimity at this, its third, stage. The tales which savages tell, and the songs which they sing around their evening fire, all bear upon the mighty deeds of kings, heroes, and gods—the three being almost indistinguishable in the earliest types. The South Pacific myths which Mr. Gill has collected and published, or the New Zealand stories narrated by Sir George Grey, show us a conception of the Sublime which never rises above this simple level. These races have no great architectural piles which might aid them in extending the feeling to inanimate masses, nor have they progressed to the anthropomorphic conception of natural forces, which enables other stocks to embrace the thunder and the storm, the seething ocean and the driving cloud, within the limits of their sense of Sublimity. Among all the embryonic literature of tribes in the stage of theology here contemplated which has yet been rendered accessible to European readers, I can find scarcely a touch that reveals any admiration or awe for the might of the external universe. The strength of men, the terrible deeds of gods, the ghosts of men, are held up to the wonder and veneration of every hearer; but not a trace can be found of any reverential feeling for the grandeur and majesty of the mighty world around them.*

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* I had better here acknowledge, once for all, my obligations to Mr. Herbert Spencer's *Principles of Sociology*, on which I base the whole of my theory, so far as regards the comparative science of religions.

A little higher up in the scale of development, however, the spiritual agency widens its sphere of operations. Without inquiring into the vexed question of *how* the ghost or deity comes to be identified with the moving power of inanimate nature, it will be sufficient for our present purpose if we recognise the fact that he *does* come to be so identified. The howling of the wind is the voice of a god; the rumbling of the thunder is his angry roar; the tempest on the ocean is stirred up by his trident; he dwells in the flaming volcano, and his blast drives aloft the molten lava; he lies under the roots of mountains, and when he turns upon his side an earthquake rends their bases. If the gods were only this, however, they would be merely an object of unmixed dread and horror; the feeling of Sublimity would never reach any higher development, and hatred or abject fear would take its place. But the gods have also their kindly side as before. It is they who send the rain and the breeze; it is they who grant plentiful harvests and abundant flocks; it is they who are the dispensers and distributors of all good things. The Roman Ceres fills the garners, and Dionysus swells the grapes of Hellas. Some of them are identified with the greater natural agents whose beneficence is obvious and undoubted. One is the warm sun who shines on the fields and gives the pleasant light of day. Another is the bright and changeful moon who comes to the aid of man in the darkness of night. A third is the clear open sky above, whence fall the quickening showers that nourish the crops. Every day yields abundant proof alike of their might and their good-will. Zeus may indeed collect the angry thunder clouds and blast the mountain-top with his fiery dart; but he oftener smiles benignly on his children, with that serene brow which well befits the father of gods and men. Awe for their power mingles strangely with hope of their favour in the minds of their votaries. Mighty and strong and irresistible they are; yet they may be turned aside by prayer and propitiated by the savour of perfect lambs and bulls.

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* Even where a tinge of the Sublime in nature is cast upon the story by a passing expression, we must guard against the possible danger of reading our own ideas into the simple and positive language of the savage.

How enormous is the amplification which this anthropomorphic envisagement of nature gives to the sphere of the Sublime we can see at a glance. The savage who has only just progressed beyond the first stage of the ghost-theory can hardly stand awestruck before the majesty of nature. The thunder is doubtless very terrible to him, and the cold wind very unpleasant; while the warmth of the sun and the coolness of the breeze are agreeable and grateful to his senses: but as he does not connect them with any underlying power, they seem to him no more than so much dead fact, without complex emotional implications. As soon, however, as he learns to see in these manifestations the acts of some occult and invisible being, he cannot fail to compare their vastness and might with the smallness and weakness of his own powers. His idea may still be a childish and an unworthy one; he may still fancy that these unseem spirits can be deceived and cajoled by the most transparent trickery; he may still hope to outwit them through craft or to frighten them with threats; but nevertheless he must recognise them as something vastly greater than mere human kings; he must take the decisive step which definitely marks off the god from the simple ghost.

If we examine such a monument of the differentiated theological stage as we possess in the Homeric ballads, we shall see how deep a hold the sense of Sublimity has there obtained over the awakening intelligence of men, no longer barbaric, but far on their way to an advanced culture. But we shall also find these four first developments of the feeling—awe towards the hero, towards the king, towards the gods, towards the divine motive power in nature—filling the whole field to the exclusion of all those more complex and elevated factors which enter into the composition of the Sublime in its highest forms. The wrath of Achilles, the waving plumes of Hector; the strong warriors of yore, amongst whom Nestor fought; the heroes of elder days, Bellerophon, Tydeus, and the might of Heracles; wide-ruling Agamemnon, Priam, and Memnon, and all the Zeus-nurtured kings; the gods of Olympus, of Hades, and of Ocean; Ares stalking before the hosts of men; Phœbus Apollo, angry in heart; Zeus assailed by the Titans who pile Pelion upon Ossa, or calling to his aid Briareus of the hundred hands;—in all these we see the feeling of awe and reverence for the strong man, the chief, the king, the deified hero, and the god whose human origin is forgotten in the dimness of past centuries. But if we look for any sense of admiration towards the great moving powers of nature, we shall find it only under an anthropomorphic guise. Poseidon the earth-shaker rouses the white billows on the limitless deep: Apollo the far-darter drives his golden car through the divine æther: Zeus the loud-thunderer collects the black clouds and darts his angry bolts upon the perjurer's head. Yet amid all this wealth of anthropinistic sublimity—a wealth which perhaps no other literature can equal in its own way—we miss any feeling for the sublime of nature in repose, any sense of grandeur in sea and sky and mountain, apart from the great shadowy beings who dwelt within them and gave life and motion to their mighty masses.

And here again we see how intimate is the connexion between the feeling of the Sublime and the sentiment of subordination. The Homeric Achæan is after his kind a law-loving man. He feels and recognises the necessity for union under a lawful chief. The rule of many is not good; let one alone be king whom Zeus appoints. The king it is who guards the divine laws, derived from Zeus. It is folly to disobey the word of one who reigns over many islands and all Argos; for a king is much the stronger when he is wroth with a man of low degree. Yet the king's sternness does not disguise the fact of his usefulness both as warrior and as leader. Nor is his power entirely his own; he holds it on sufferance of Zeus, who will not allow his divine laws to be lightly set aside. The gods themselves, too, are often harsh, yet they are kindly in their softer moods. Angry Phœbus sends a pestilence, but he may be propitiated with hecatombs, and with a lustration whose sanitary effects must obviously be useful in checking the arrows of the god. Zeus watches over the faith of treaties, and punishes the perjured head. Artemis avenges the loss of chastity. Demeter puts forth the green corn; Athene gives the olive; Dionysus sheds his wine into the vats. With the might of Ares men conquer in battle; by the counsel of Pallas they speak words of wisdom in the Agora. In one way or another every one of these beliefs gives some point of superiority to its votaries, by hedging round with sanctity an ethical observance, by promoting a useful social custom, or by giving confidence in war or debate to the warrior and the orator. And with every such advance the feeling of Sublimity must grow more and more definite, more and more structurally innate, in the minds of each new generation amongst the successful races of mankind.

If we step aside for a moment from our main line of exposition to compare the monarchical Achæan ballads with the later democratic Athenian drama, we shall see how the change of political circumstances influenced the sense of the Sublime. The Attic tragedians show us a measured and self-respecting religious feeling, which pays all due honour to the gods. But the reverence of the king has passed away. We do indeed see traces of the legendary monarchical feeling, introduced as historical colouring; but the democratic sympathies of the writers crop out at every turn. Agamemnon treading on the carpet, Ajax mad, Xerxes and Atossa infatuate and defeated, the ragged heroes of Euripides, the ribald irreverence of Aristophanes, are a few indications of the change. The heroes speak in noble and austere language, but it is the language of moral suasion, of deliberate counsel, of thoughtful resolve. When Ajax lies unburied, when Philoctetes is cajoled into the power of his enemy, when Antigone is dragged away to slaughter, when Polyxena is torn from her mother's arms, all the sympathies of the audience are with the oppressed against the tyrants. But when we turn to divine matters, the spirit of subordination is once more apparent. Prometheus welters on the snowy rocks of Caucasus, a rebel against the irresistible might of Zeus; Orestes is driven madly over the stage by the awful figures of the Eumenides, until he clears himself of blood-guiltiness before the solemn tribunal of Phœbus; Pentheus is torn piecemeal by the Bacchants for daring to interdict the holy orgies of Dionysus. Even if we compare the tragedians among themselves we see somewhat the same differences in the earlier and the later. Æschylus the religious conservative is full of awe for gods and heroes, of respect for time-honoured institutions, of modified veneration for the great monarchs of early legend; but Euripides the philosophical radical loves to exhibit the folly and the passions of kings, and has little reverence even for the great gods themselves. Occasionally, too, in the works of the glorious Athenian period we find tinges of a higher and grander Sublime; as in that marvellous lyrical spectacle, the Persæ, where the poet impresses upon his audience a full appreciation of that noble sight, a free people banded together under their own chosen leaders, fighting for liberty and culture against the aggressive hordes of a barbaric despot. "We too have a master," says the free Hellene to the Oriental tyrant, "whom we serve far better than your slaves serve you, and his name is Law".

But we must return from this digression to follow out the development of the Sublime in its regular historical course. There is another element of sublimity which has arisen earlier, perhaps, than those already considered, but which introduces a somewhat different original factor, and so has been postponed to the present place. I mean the element of material *bigness* in human or natural products. To put the difference briefly we may say that the elements we have so far examined depend for their impression on *force;* while the present one depends on *size.*

Originally, we saw, the notion of the Sublime took its beginning from the effects which a man could produce, and especially from the strength or agility of the strongest. Thence it progressed to the power of kings, of ghosts, of gods, and of natural agents anthropomorphically conceived. In all these cases it is evident that the main idea is one of superior force, exercised in a manner not wholly adverse, or rather partially beneficent, to the individual, the tribe, and the race of men generally. But how did the sense of Sublimity come to entwine itself around the physically *big,* viewed in repose ? I think this element of the Sublime is itself ultimately resolvable into the same admiration for superior force, always, of course, in alliance with the subordinative sentiment, governmental or religious. Let us see how.

Among the commonest instances of that love for the production of an effect, which we took as the psychological starting-point of our inquiry, is the erection of a conspicuous mass of matter. Children make sand-heaps and big snow-balls, or build card-houses and castles of bricks. Savages pile barrows over their dead, raise huge cairns on mountain tops, and lift massive stones into cromlechs, avenues, and monolithic circles. In all these acts, they can gratify the natural love of effect, the desire to do something which shall produce a striking and noticeable change in the surrounding scene. Especially do primitive men enjoy the power which they thus possess of giving a permanence to the form which they impress on large masses of matter. But when we reach the developed kingly stage, we find this impulse taking a fresh start in the direction of vicarious effort. A great king shows his power by the number and strength of his subjects, the implicit obedience of his vast armies, the hundreds of captured cities, the thousands of slaughtered or mutilated foes ; but he can also show it by building for himself or his ancestors, palaces, temples, tombs, and colossal statues. Hence we find that almost all great despots erect huge piles of architecture to demonstrate their might, and strike wholesome awe into the breasts of their subjects. Whether we examine the Pyramids, the Sphinx, the Memnon, and the temples of Karnac, or turn to the winged bulls and sculptured courtyards of Nineveh, we shall notice alike that architecture is devoted to the aggrandisement of the king and the due subordination of the subject. The lesson preached in every bas-relief and every painting is the same: obey the great king who is the taker of cities and the ruler of peoples. If from the palaces and tombs we turn to the temples, we find the religious tie added to the governmental. A huge hall, with row after row of mighty granite columns, and a colossal figure of the tutelary god, strikes deep reverence into the mind of the beholder. In whatever part of the world we look, we see the same story repeated. From the caves and topes of India to the pyramids and temples of Mexico, we see architecture everywhere allied with despotism and the religious subordination. Even in republican communities, like Athens and Rome, the sacred use survives, and the home of Athene on the Acropolis or of Jupiter on the Capitol peers down with lordly disdain upon the lesser roofs of men and citizens.

Indeed, it would be interesting, did space permit, to point out how very close and almost invariable is the connexion here hinted. It would be necessary then to show how imperial Rome, with her Domus Aurea, her Colosseum, her Baths, her Triumphal Arches, her Basilicas, followed in the wake of ancient Memphis and Babylon: how, in later times, the Medici adorned Florence, and then Rome: how Louis XIV. had his Versailles, and Napoleon III. his new Paris. We might pass over to the mosques with which the Mughal dynasty adorned the plain of Delhi, and to the palaces and pagodas of Pekin. And we might glance at our own European Cathedrals, and trace the changed aspect of governmental machinery in the Parliament Houses of Westminster, the Capitol at Washington, or the disproportionate and costly mass of Gothic edifices which the Canadians are raising for public offices at Ottawa. But such a survey would detain us too long, and the instances thus rapidly cited will serve to suggest to the mind of the reader how large a share, in the development of the political and ecclesiastical restraining system, has been borne by mere mechanical vastness in the machinery employed.

Now, with the growth of such massive and laborious piles must come the appreciation and admiration for their size and structure. The boy when he has rolled his big snowball, the savage when he has lifted on end his monstrous monolith, the despot when he has heaped his colossal pyramid, each stands by to admire his work, and feels his heart swell with pride at the effect of his personal or vicarious labours. The boy's comrades, the savage's fellows, will join him in a sympathetic appreciation; while the subjects of our primitive despot will see another mark of that god-like power and infinite superiority which is daily impressed upon them in ten thousand ways. Whoever looks upon their piles, even to this day, cannot fail to think upon the thousands of workmen, the years of toil, employed in raising those solid blocks of granite, one above another, to so lofty a height. And on those who lived amongst them, and saw with their own eyes, year after year, the Great Pyramid rising slowly towards the sky, some vague feeling of awe for the visible symbol of majesty could not fail to be impressed. We can hardly doubt, I think, that the admiration for what is vast in the outer world must be ultimately traced back to the admiration for what is vast in the works of man: just as we have already seen that the forces of inanimate nature only excited wonder and reverence when they came to be figured in terms of human force. Children admire a big building or statue long before they have developed the feeling of admiration for a mountain or a waterfall.

It is hardly necessary to add that the skill, the mechanical power, and the organisation, evolved during the gradual growth of such works, themselves form useful aids to the race in the struggle with other races, and ultimately beget that higher civilisation which enables its possessors to compete on terms of immense superiority with every inferior type of humanity.

As yet, however, we have not seen how the sublimity of nature-in-repose first comes to be appreciated. In modern times, the most obvious instances of the Sublime which strike us are those of ice-clad mountains, tottering crags, deep ravines, cataracts like Niagara, the broad expanse of ocean, and the starry vault of heaven. Yet not one of these seems to produce much effect upon men up to a very high pitch of culture. The Greeks and Romans, even, were little impressed by them. The Alps they regarded mainly in the utilitarian light of so much useless ice and snow, placed on the highroad to Gaul and Germany. Mountains are to them nothing more than mere barriers; their epithets are mostly *shadeless, barren, inhospitable, chilly.* The ancient cultivated nations admired much the picturesque in scenery or in man's handiwork, and the grand in human nature or divine beings: but they cared little for mere vastness in the external world. There is a certain mode of reviewing our own feelings on the subject which, I think, will show us the reason for this difference.

Very few people feel any thrill of Sublimity as they look over a very wide and flat plain, a level expanse of sand, or a calm and unbroken stretch of sea. But if in the midst of the plain a few bold rocks rise threateningly on high, their admiration is at once arrested. The position of the rocks inevitably suggests some vague notion that they were *put there;* and in this suggestion we get a point of comparison with human force: while the flat plain seems, so to speak, as though it were *naturally there,* and does not at all vividly suggest the notion of any human or supernatural agency at work. So, too, with the sea:

while it remains calm, we see in it only a beautiful field of soft blue colour; but when a tempest raises its waves, we picture it to ourselves as angry, as violent, as a living thing; we compare its roar, its sweep, its tremendous energy, with the puniness of our own arms, of our drifting ships, and of our beaten breakwaters. Again, in proportion as the mass of a mountain is great, and its sides abrupt, we think more and more of the gigantic power which would be required to pile it to such a height. But we do not *see* the power at work. If, however, we watch a volcano in eruption, the feeling of Sublimity is enormously increased. In fact, wherever there is an actual display of energy, the sense of Sublimity is most strongly aroused: where the energy is only suggested, the emotion is comparatively vague: and where energy does not enter at all into the idea, Sublimity is not suggested by the mere bigness of an external object. We require some hint which will assimilate the object to a human product before we can find in it a germ of the Sublime.

Now to all modern minds the notion of the world as created, as made by God, has been familiar from childhood. The idea of force exerted in raising every mountain, in planing every crag, in scooping out every ravine, is immediately suggested to our minds together with the objects themselves. I do not say that we all accept the direct theory of creation in its crude form: but even those of us who have substituted the scientific conception of natural causes for the older belief in personal divine intervention, still carry about with us predispositions of thought which were contracted under the earlier creed. Indeed, we see the energies involved even more clearly than do those persons who still envisage them in the vague metaphors of religion. When we stand in the riven gorge of Pfäffers or the water-worn ravine of the Niagara, we can realise the endless working of that slowly encroaching power with far greater vividness than the unscientific thinker can give to his verbal picture of rocks rent asunder by the finger of God. Yet the old school and the new school of moderns are alike in this, that they see indications of moving energy, natural or supernatural, in every conspicuous mass of the material universe. The ancient cultivated races, on the other hand, seldom or never inquired how the universe came to be there or assumed its existing form; they accepted it simply as given, or if they made any conjecture on the subject, they concluded that it had been there as it was, from eternity.* We of to-day, whether we see in a mountain a piece of God's own handiwork or a product of enormous eruptive forces, at any rate think of it as *raised:* the Greek or the Roman simply thought of it as *lying*. And if we go back to the origin of this feeling on our part, I believe we must seek it in the Hebrew cosmogony. For when we search for any sense of Sublimity in the old world at all comparable to that which is common in the new, we find it only in the wonderful prelude of Genesis, the mystical visions of Ezekiel, and the thundering periods of Job.

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* Such exceptional cases as that of Lucretius—an embryo Laplace or Darwin—will be noticed hereafter. For the present it will be sufficient to observe that such persons had a feeling of the Sublime infinitely raised above the average level of their time and race.

The mere savage never asks who made the world. If you put the question to him, he thinks it childish and absurd:—the world was always there of course. Even to the Greek and the Roman, the gods were a part of the world:—they sprang from it, they moved in it, but they did not make it. The universe was as objective to Zeus as to his worshipper: it lay quite outside the sphere of divinity. The gods wrought on it as man wrought on it: it was their material, and they gave it sometimes a new shape. But that short declaration, "In the beginning God created the heaven and the earth," contained the germ of a whole new development for the sense of the Sublime. Even Longinus noticed the wonderful majesty of the primæval fiat—"Let there be light, and there was light". Indeed, monotheism in every way offers immense opportunities for the evolution of the Sublime. By substituting for the many opposing and mutually-limiting gods of the polytheist a single supreme and infinite God, it concentrates on one point all the veneration and love of his worshippers. And when this God comes to be conceived as the maker and architect of the universe, the sense of his irresistible might becomes overwhelming. Nature is thought of as his outer manifestation. The heavens declare the glory of God, and the firmament showeth His handiwork. They are the work of His fingers: the moon and the stars He has ordained. The earth is the Lord's and the fulness thereof, the world and they that dwell therein. By the word of the Lord were the heavens made, and all the host of them by the breath of His mouth. When He speaks out of the whirlwind to Job, man learns his own weakness and folly, by the measure of his maker. "Where wast thou when I laid the foundations of the earth? Who hath laid the measures thereof, if thou knowest?" Behemoth and Leviathan testify to His might. The mountains skip before Him like a calf; He rideth upon the heavens, and the earth is His footstool, the hill of God is as the hill of Bashan, an high hill as the hill of Bashan. There is more true sublimity in half a dozen Psalms or four chapters of Job than in all the odes of Pindar and all the tragedies of Æschylus.

But here again, as in every other case, we find an undercurrent of love and trustfulness, half hidden beneath the sense of reverence. The God who created heaven and earth is emphatically the God of Israel. He has made an everlasting covenant with His chosen people. He is not a man that He should lie, and He is of purer eyes than to behold iniquity. But His mercy endureth forever; He hath not despised nor abhorred the affliction of the afflicted, neither hath He hid His face from him. "The Lord is my shepherd," the poet can sing; "I shall not want. He maketh me to lie down in green pastures; He leadeth me beside the still waters." "I, even I," says Jehovah, by the mouth of His prophet, "am He that comforteth you: who art thou, that thou shouldest be afraid of a man that shall die, and of the son of man which shall be made as grass, and forgettest the Lord thy maker, that hath stretched forth the heavens, and laid the foundations of the earth?" In every line of the Hebrew poetry and every page of the Hebrew chronicles we see this overwhelming conception of the might and majesty, the loving care and protection, of the God of Israel.

It is needless to point out how this feeling, too, was an element of success in the battle of races. The monotheistic creeds have spread irresistibly from Hindustan to California, and have proved by incontestable results their ability to hold their own in conflict with every inferior faith. Nowhere can the heathen oppose a solid front to the aggressive hosts of Christianity and Islam.

The modern world, nursed upon the grand utterances of the Hebrew bards, has imbibed the sense of the Sublime almost with its mother's milk—nay, one may even say, before it. For every one of us is now born into the world with a hereditary capacity for that mingled feeling of awe and security which constitutes the essence of the Sublime. The feeling is not entirely pleasurable; it is partly ethical and subordinative. It passes very readily into fear and distress, as in the case of a thunderstorm, a tempest at sea, or a volcanic eruption. Even such a terrific gorge as the Via Mala, or such a cataract as the St. Lawrence rapids, is rather frightening than impressive. Cliffs and crags give us a more agreeable sensation viewed from a slight distance than when we stand just beneath their threatening mass. But they all yield us a certain sympathetic pleasure as evidences of power, natural or divine. The stock reflection of moralists on all such subjects is the puniness of man and the power of his great Creator. I find in a little guide-book to Niagara eight pieces of verse by different hands, every one of which turns as a pivot upon the self-same idea. The religion which for twenty centuries has taught us to see everywhere some token of the greatness and goodness of God, is now engrained in our nervous systems, and produces its effects unconsciously in our everyday life.

A last question remains. Will the sense of Sublimity decrease as the notion of fixed law supersedes that of capricious divine interposition ? There are good reasons for thinking that it will *not.*

The progress of scientific thought has opened before us a field for the exercise of our faculty of Sublimity almost as new and extensive as that which was laid open by the monotheistic creed and the doctrine of creation. The microscope has revealed to us the marvellous intricacy of coral and shell and zoophyte: it has shown us the feathery scales on the butterfly's wing, and the countless facets of the insect's eye: it has made visible the minute structure of every animal tissue, and the complicated architecture of every vegetable fibre. In each of these the man of science saw fresh proofs of design and power, which have slowly led the way towards a new conception of Sublimity. Meanwhile, the telescope enlarged our view from the solid firmament of the Psalmists to the boundless realms of space which the eye of a Newton or a Herschel sees peopled with innumerable suns, and countless systems of eddying worlds. Geology taught us to look back, not over a few thousand measurable years, but over immeasurable æons of historic time, stretching back into a vast and unknown past. And now we have learned to picture our earth as a speck of matter floating in an ocean of space, and our era as a second of time marked on the infinite dial of eternity. Through a boundless void which our miles cannot measure, through an endless period which our centuries cannot gauge, we see the workings of that infinite, absolute, unknowable Entity, which manifests itself eternally in the heavens and the earth and the soul of man. We spell out its operations in the fiery sea from which sun and planet drifted towards their appointed centres ; in the slow growth of living forms upon their cooling crust ; in the myriads of beautiful beings which people a drop of water ; in the noble aspirations and earnest moral yearnings of the human race. Surely our idea of the ultimate Being has not been lowered or degraded by this vast extension of our knowledge and our vision !

But perhaps it may be objected that we have here only the awful side of the Sublime and not its comforting or protecting aspect. Perhaps to a certain extent this is true : and indeed, every step in the evolution of the feeling has made the centre round which it gathered more awful because more absolutely and indefinitely powerful. But at the same time, each step has brought with it a limitation in the capriciousness, the favouritism, the uncertain demeanour of the being—man, king, ghost, or god—towards whom the sentiment was principally directed. And in this last substitution of a Power working through knowable laws, for a Power working by inscrutable volitions, we get a further advance in the same direction. There is an element of pleasure in the certainty and security of Law. No comet now brings war or pestilence; no portents and prodigies disturb our peace and demand propitiatory sacrifices. We rest on the safe ground of known causes: and when danger threatens we can meet it by our own manful endeavours, not by slavish submission. Pestilence can be warded off by sanitary care; famine by wise precaution; war by prudent and moral self-restraint. The great Power which underlies the universe will not repent of acts done or wreak capricious vengeance on offenders. We can go on fearlessly upon our path, obedient to the great natural laws without us, and the ethical principle which is developing within us; and we need tremble at no bugbear of superstition, as we pursue our onward and upward course, towards fuller knowledge and purer life.

And here we may turn back to notice how the truest conception of the Sublime has always been that of those men who were most in advance of their age. The poet who knew that the best of omens was to fight for one's fatherland—the prophet who knew that God would have righteousness and not burnt-offerings—these are they who feel the deepest thrill of the Sublime, and speak it out clearest for our hearing to this day. And among the solid matter-of-fact Roman people, the solitary singer whose words still ring in our ears for their sublimity was the one who knew the reasons of things and trampled under foot fears and inexorable doom and greedy Acheron's din. He it was, who, like some Laplace born out of due season, beheld the atoms drifting through the mighty void, and discerned with his eyes the beginning of things. And vaguely as he saw these truths, yet he felt among the blind and ignorant multitude like one who sitting safe upon some jutting peak beholds the tempest-driven mariners out at sea tossed by the waves and vainly stretching their hands to their painted gods. As Lucretius felt the beauty and sublimity of the Græco-Roman myths not less but more than other men, so may we well suspect that science will give us in the future not a lower but a higher appreciation of the Sublime, throughout that immeasurable universe which she is daily opening more and more clearly to our dazzled and astonished gaze.

Yet from beginning to end we see that the sense of Sublimity is everywhere allied with the regulative principle of subordination. The laws of nature rule us now as firmly and inexorably as the savage chieftain rules his naked subjects. And by obeying and conforming to those laws we can secure ourselves life and happiness; while by opposing and transgressing their teaching we have our punishment in death and misery. The true place of the Sublime in the scheme of our faculties is next to the regulative and directive ethical feelings: though it forms a connecting link between these and the æsthetic sense in its proper acceptation.

GRANT ALLEN.

IV.—INTUITION AND INFERENCE.

I.—INTUITION.

THE meaning of the term Intuition and the scope and limits of the mental capabilities represented thereby have long been unsettled in philosophical speculation. Of so much importance has the name become that its adjective characterises a distinct (or supposed distinct) school in philosophy, whose members claim a proper extension of the denomination beyond what is allowed by their antagonists. With almost all Intuitionalists the name Intuition covers much more than their opponents allow that it can include; in what respects they make such an extension we shall presently see. The applications of the term Inference have not been subject to so much doubt and uncertainty as have those of Intuition, though, indeed, it should be said that the fundamental facts of inferential knowledge are not yet so completely laid bare as to leave nothing further for the explorer to do. Intuition and Inference usually are contrasted with each other as being two separate and antithetical modes of mental experience. Intuition is generally referred to as primary and fundamental, while Inference is accounted secondary and superstructive. But as far as one has been made dependent upon the other, mankind has been disposed to measure Inference by Intuition rather than Intuition by Inference. Intuition has been regarded as a source of or method of obtaining transcendental, pure, and trustworthy knowledge; while Inference has been esteemed to yield only experiential, mixed, and uncertain information. Intuition is thus held to be the more important, partly because the knowledge it gives is considered to be primary and partly because that knowledge is deemed more clear and certain. Another and very potent reason for the *empressement* with which Intuition has been treated lies in the fact that men have been alive to the convenience of possessing a standard superior to and independent of Inference, to which they might appeal when bias or interest called for the establishment of a point and inferential processes failed to yield the desired results. Deeming it a matter of importance, therefore, to ascertain, if possible, the true significations of these words and to analyse the mental acts, states, or products for which they stand, we will devote some pages to such a task.

Upon one thing in regard to Intuition the philosophers have been almost universally agreed, namely, that we do cognise by Intuition the phenomena of the external world and the phenomena of our own minds. Whether in seeing a tree we cognise anything more than the phenomenal qualities, and, if we do, whether we cognise intuitively or inferentially, are questions in regard to which there has been dispute, and which are not altogether easy of settlement ; but as to the phenomena there is no question and can be none, save in the misunderstandings of people who, like Dr Johnson, think they are refuting Berkeley by kicking a stone. Nobody has been found, I believe, to set forth that we know phenomena otherwise than by Intuition. Accordingly in this investigation of the meaning of the term and the sources and nature of the power, we may take our departure from this point, looking for the essential import of the name in that to which by universal consent it is correctly applied, and leaving for subsequent elucidation the extent and confines of its proper employment.

Etymologically considered, the word Intuition means a *beholding*, and it usually has been construed to designate an *immediate beholding*. This immediacy of cognition seems to be the essential character of an intuition. There is nothing intervening between the cognising mind and the object of cognition ; the mind looks directly upon that object. I move my arm: I am conscious directly of the movement. Something strikes my foot : I cognise the pain immediately. A ray of light reaches my eye : I apprehend the colour without any intervening medium. I close my eyes and reflect ; I remember what happened yesterday : that there is a mental action I am aware immediately; in having an idea I know that I have an idea, at once and indubitably. All these are instances of presentative phenomenal cognitions ; thus out of the fact in regard to which all thinkers are consentient we obtain for Intuition both illustration and definition. It is perhaps allowable to assume here that the immediacy is the essence of the term in all cases where the cognitions though not presentative are claimed to be and are called intuitive. It is said, for instance, that we know Being intuitively, meaning that we know it in the clearest and completest manner in which we know anything, that is to say, immediately. For we know what we know intuitively "without the intervention of any other idea"; and, to quote further the words of Locke—"this kind of knowledge is the clearest and most certain that human frailty is capable of. This part of knowledge is irresistible, and like bright sunshine forces itself immediately to be perceived as soon as ever the mind turns that way; and leaves no room for hesitation, doubt, or examination, but the mind is presently filled with the clear light of it. 'Tis on this intuition that depends all the certainty and evidence of all our knowledge, which certainly every one finds to be so great that he cannot imagine, and therefore not require a greater."* If then it be allowed (and it will hardly be disputed) that by *intuitive* is meant "the clearest and most certain" knowledge, and that such knowledge is the clearest and most certain as is cognised "without the intervention of any other idea," immediateness may be accepted as a criterion of intuitive cognition, and Intuition may be defined as "immediate beholding". It is hence apparent that the question to be settled in a given case of doubt as to whether anything is an intuition or not, is simply whether the given object is cognised immediately or mediately: if the former the cognition is intuitive, if the latter it is not intuitive.

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What cognitions then are immediate? At least all cognitions so far forth as they are presentative: if such are not immediate, no cognitions are immediate, and the word is destitute of meaning. In discussing representative cognitions (MIND, No. X, p. 270) it has been noticed that they have in a marked degree both a presentative and a representative side. In their presentative aspect, they are ideas as phenomena irrespective of their signification; as representative, they are reproductions of former experience known as such. I think of a rose seen yesterday and not now present: this idea of a rose is a presentative experience in so far as it is a mere mental phenomenon; that I have this idea I cognise immediately; but in so far as I cognise the idea as a representation of yesterday's experience, the cognition is representative, and such a cognition of the prior experience is effected through the medium of the present idea. In representative cognition, therefore, so far forth as it is representative, we must be said to re-cognise a fact through the intervention of a present idea. Representative cognition is hence mediate.

In the distinction between presentative and representative knowledge lies the entire difference between immediate and mediate cognition, and thus between intuitions and those cognitions which are not intuitive. Just here lies the solution of the whole difficulty in which metaphysics has been involved over intuitive and non-intuitive knowledge. It is the neglect of this distinction and the want of a sufficient understanding of the

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* Locke: *Essay concerning Human Understanding*, Bk. IV., ch. 2, §1.

growth of representative cognition, its differentiations and redintegrations, that has led men to such contradictory and confused notions of the meaning of Intuition. It is attention to this difference and careful association of intuition with presentative knowledge and non-intuition with representative, that will alone keep the mind free from confusion upon this topic. To the extent that a cognition is presentative, it is intuitive; in the degree that it is representative, it is not intuitive. In order to make this truth plainer, and to support it, we will now review the different degrees of presentative and representative cognitions in greater detail, and after such an examination we shall be able, as there arises occasion, to note the aberrations of philosophers on the subject, seeing how and where they have departed from the narrow path, adherence to which (in my judgment) can alone save the traveller from becoming entangled in a pathless maze.

But a word is needed in this place in regard to the co-ordinate subject of this essay. If Inference be opposed to Intuition, so that the two exclude each other, the former must be separated from presentative cognition and ranked with representative. And this seems presumptively the proper course to take. Certainly when we infer a thing we do not behold it immediately, but mediately; and when we intuite any object we do not infer anything so far as we intuite it. Inference may take place collaterally, but that which is intuition is outside and exclusive of whatever inference there may be. Yet we are not at present prepared to say that inference is co-extensive with representative cognition; for though it appears that every inference is mediate cognition, it is not yet evident that every mediate cognition is an inference.

Leaving the subject of Inference, however, for subsequent treatment, let us now examine some intuitions and so-called intuitions. It will readily be admitted that cognition is almost wholly intuitive in the lowest grade of presentative cognition, wherein the mind occupies itself with localising on the body a single sensation, as a burn on the hand. The sensation of the pain in the member is apprehended intellectually by intuition; the representative element is least evident. But even in these simplest intuitions the question meets us—What is it we immediately behold? If it be replied that we intuite the sensation, it is necessary to know what is the sensation. So far as it is feeling, we feel it; so far as it is cognition, and subject to analysis, we may ascertain the elements of which the cognition is composed. In a preceding essay ("Knowledge and Belief," MIND, No. IX.) it has been found that every act of knowing (and believing as well) involves certain fundamental relations present and cognised; the relations of which we are conscious are *Agreement, Difference, Time, Representation,* and *Power,* these names being general expressions to designate the relations cognised in every act of knowing. We have an intuition of things involving these relations. We do not immediately cognise agreement in general, difference in general, time in general, and so forth, but we behold intuitively an object presented as the same with itself, as different from another beside it, as continuing, and as succeeding or preceding another. By analysis we discover these general and fundamental constituents of every cognition; that is, we discover them by reflection, which is to say, mediately. What we intuite is in each case certain sensations cognised by ourselves. In each individual experience we have an intuition of something agreeing with something, something differing from something, something represented, something continuing, and something succeeding something, while in the consciousness of *something* we have also what has been termed *consciousness of power,* active and passive; but the expressions by which we describe these experiences mark generalisations which are not intuitive.

It must not escape attention that there exists also from the very dawn of consciousness, even in the cognitions most characteristically presentative, an element of representation which is not immediate. Every item of conscious experience requires representation in order that there may be any continuity of experience. Hence there are no unmixed intuitions; intuition is succeeded by representation and the converse. Intuitive cognitions alone would be like flashes of lightning in the night, for a moment illuminating, but after an instant going out, and leaving only thick darkness. Where the representative constituent is less prominent than the presentative the cognition may be called prevailingly intuitive, but in all cases there is an element not intuitive.

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Since in all cognition there is a discrimination between self and not-self, between the phenomena of mind and not-mind, it follows that at every instant of conscious experience we intuite a difference between the Ego and the Non-Ego. It is important that the character of this intuition be not misunderstood. In describing an intuition we are forced to use language which makes a cognition not immediate but mediate; we can only treat of immediate cognitions by mediate ones; we can know that we have presentative experience only by representative cognition. The cognition signified by the term Ego embraces a series of experiences terminating at the present moment; equally so the cognition made manifest by the name Non-Ego. If we speak of knowing the Ego and the Non-Ego by intuition, we shall be almost certain to err unless we keep in mind this fact. We do not know by intuition that the Ego of to-day is the Ego of yesterday, nor that the Ego of yesterday is different from the Non-Ego of to-day, nor that the Ego of yesterday is different from the Non-Ego of yesterday; for such knowledge is dependent upon representation. We merely cognise intuitively at each successive moment of time, so small as to be definitely inappreciable, that Ego *am* other than Non-Ego. In no way different is the discrimination intuitively made between the phenomena which connect directly with the external world and those which appertain exclusively or concurrently to mind. Whatever intuitions we have of space, matter, force, time, and motion, are intuitions only of space, matter, force, time, and motion, as in and composing each external object or phenomenon we cognise. From moment to moment we have intuitions, presentative experiences, which representation discovers to involve these relations. We have no intuition of space in general, force in general, motion in general, but only intuitions of something extended, something resisting, something moving. We shall have occasion to refer to these cognitions of space, force, motion, &c., in a subsequent paragraph, and till then we will dismiss them from consideration.

We now pass to a higher grade of presentative cognitions, namely, those in which a plurality of sensation is distinguished and localised upon the body. How far do we cognise intuitively the prick of a pin upon the hand and the simultaneous impact of a stone or block of wood upon the foot, supposing that neither of the two sensations is so intense as to overpower the other, nor so faint as to be unheeded in the presence of the other? The answer to this question is implicated in the reply to be given to the more general query—What is co-existence? The answer to the latter interrogation is perhaps not yet to be considered settled. It seems to have been pretty well made out, however, that co-existence is but a form of succession. In such a view a cognition made up of two simultaneous sensations would have in its composition a larger amount of representation than where a single sensation is cognised. For, in order to sustain the two together, a representative cognition must alternate with a presentative in very close succession: while sensation A is present sensation B must be represented in association, and while sensation B is occupying present attention there must be a mental reproduction of sensation A in contiguity therewith; the mind passes from A to B and from B to A, giving specific present attention to each in turn and losing sight of neither. In the cognition of co-existent phenomena there is accordingly an additional grain of representation over the preceding case, and hence a less amount

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of intuition. But if, on the other hand, it finally be made evident that co-existence is not resolvable ultimately into succession, but that the mind actually and literally can apprehend two things at the same time, the intuition involved in the cognition of co-existent sensations would be of precisely the same character and in precisely the same degree as in the inferior grade (in complexity) of presentative cognitions which was noticed in paragraphs just preceding; the amount of representation relatively to the amount of presentation would be the same in both instances.

A still more complex degree of cognition occurs in the perception of external objects. In viewing a book lying on the table I do not see the under side of it at all, yet I am perfectly well assured that if I turn the book on the edge I should see something substantially like what I now see. I have an intuition of the upper surface, but I mentally complete the book by reproducing my past experience of the structure and form of books. When therefore I say I intuite a book before me (if such a verb may be formed), I do not speak correctly. The proportion of representation in the cognition is not so large as when I think of a book, none being before me, yet it is considerably larger than when I apprehend a pain in my head, or a pain in my head and the pleasurable odour of a rose co-existently or successively. Therefore, in perceiving whole objects in nature, I cognise a portion immediately and with this immediate cognition I cognise another part mediately. Perception of objects is hence partially intuition and partially not intuition. Of course, where there is a plurality of objects cognised, there is an increase of complexity in the cognition, but the relative proportion of immediate and mediate cognition remains about the same; at any rate, whatever difference there may be is not of a sufficiently distinctive character, in kind, to need more particular explanation.

In the case of ideas considered as mental phenomena irrespective of their representative aspect, the same line of observation may be pursued. Every such cognition is immediate or mediate according as it is viewed; there is a sort of double consciousness which has not been resolved into anything more ultimate—so to speak, a consciousness of presentation and a consciousness of representation. But even when we are regarding an idea simply as a phenomenon, the peculiarity must be noted that even on the presentative side there is also representation, else the idea could not continue as an idea but would be evanescent and incognisable.

Having now run over the different ranks of presentative cognitions, let us turn to those characteristically representative, in order that we may have opportunity to see in greater detail what cognitions cannot in any sense be said to be intuitions. The simplest representative cognitions need not detain us long. Recollections of events or trains of events, appearances or collections of appearances, are not intuitive. In remembering a man whom I met on the street the other day, in recalling the features of a landscape I saw last summer, in reviewing the scenes of my school-days, in reproducing in idea as well as I am able the pains of a fit of sickness or the delights of a concert or spectacle, I have no intuition, but only a mediate cognition of the past experience. These things are matters of remembrance or recollection; nobody claims that the name intuition is applicable to them (excepting always the consideration of these cognitions simply as ideas).

Representative cognitions, wherein parts of experiences are transposed and transferred from one connexion to another, but so preserved in their integrity as to be traceable and recognisable, exemplify a higher degree of complexity in cognition, but exhibit nothing essentially different from the last case as regards the points now under consideration. There may be in my room a bust of Washington and one of Lincoln, and I can very readily imagine the Washington head on the Lincoln shoulders or *vice versâ*. It is evident, however, in my mind that the head I put on Lincoln's shoulders in idea is a representation of the head which I have seen on the Washington bust. I simply make a constructive junction of two mediate cognitions. There is no intuition but the intuition of an idea of a bust made up as aforesaid. In all the varieties of representative cognitions thus far noticed, there is no disagreement among philosophers as to the fact that the cognitions are not intuitive.

Advancing a little further in the course of the elaboration of knowledge, we meet with combinations of parts and wholes of experience into new wholes, forming what are known as general and abstract notions. These may occur alone or in couples, which unite cognitions of varying generalities in judgments. As to the character of general and abstract notions, there have existed wide differences of opinion. Some thinkers have considered them to be intuitions *par eminence*, while admitting their generality and abstractness; others have denominated some particular cognitions of this class intuitions, while they have denied the name to the fellows of these cognitions. Correspondingly, those judgments which express general knowledge have often been called intuitive, and it seems as if the higher and more far-reaching the generality the more confidently the term has been applied. In fact, nearly all cognition whatever reaching in complexity beyond that characterised in the last paragraph, has at some time and by some one been dubbed intuitional. But all those cognitions which are marked by general and abstract names, even those indicated by the names Being, Time, Space, Substance, Motion, Power, Force, The Infinite, The Absolute, The Beautiful, The True, The Good, and the like, are reached by abstraction and generalisation; they are thus representative, hence mediate, hence not intuitive. This conclusion, however, does not determine whether or not they are innate, necessary, or universal. That such cognitions have been held intuitive is owing to the fact that thinkers have failed to apprehend the difference (or to keep it before them) of an act of present apprehension and the results of remembering, connecting, abstracting from, and generalising such acts; also to the fact that thinkers from a hazy, mystical habit of thought, from the fear of consequences to some of their prejudices, and from a want of careful observation and profound analysis, have been led to assume the existence of a super-sensible undefined faculty of the mind to see by "the mind's eye" what they have crudely imagined ought to be seen, or what they would like to have seen.

We may be asked here what disposition is to be made of axioms? *The whole is greater than a part; Two straight lines cannot enclose a space; If equals are added to equals the sums will be equal*, will be cited. The answer to be given to such queries is that axioms are generalisations or expressive of generalisations. If the first proposition were *This whole now before me is greater than its part*, we might consider that the cognition represented by the phrase was intuitive, but as the axiom stands (and if it were not in that form it would not be an axiom), the meaning is not the whole before me, but all wholes that I have ever seen or shall see, all wholes in fact that anybody has seen or can conceive of. Now, without discussing the origin of such cognitions as are called axiomatic, it may at least be asserted generally that our cognition of their truth is not a matter of knowledge but of belief. We *believe* that all wholes are and will be found to be greater than their parts. We associate together in thought a number of wholes. But association and belief are not allied to immediate cognition; belief is always mediate cognition. Similar observations may be made of the other axioms mentioned; also of any others that might be mentioned. They are generalisations from experiences which are intuitive, but are not themselves the experiences. To call them intuitions is to confound important distinctions of knowledge, and work confusion.

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Dismissing the axioms, it may be observed that in comparing objects and referring them to classes, or in cognising objects as comprehended under classes, as when we say *Trees are green, Apples are sweet and sour, Man is mortal*, the predicates are always highly representative and the subjects may be so. The prevailing character of the cognition is thus representative and mediate, and the knowledge as a product is mediate. Here we shall probably have no one to contradict us. And much more is such a characterisation applicable to chains of reasoning as syllogisms. Reasoning is held by all to be mediate cognition. But in passing to the highest grade of representative cognitions, wherein general notions and particular cognitions are combined in forms making highly complex wholes which have no correspondent reality, in maintaining that intuition is absent except as to the ideas considered as phenomena, we might again encounter opposition from those esteeming that man has a "reason" or "intellectual intuition". Many think their visions are revelations of a reality transcending experience. Some religious enthusiasts would claim that their imaginative flights in the portrayal of the glories of God's kingdom are intuitive cognitions of supermundane realities. Such descriptions as those given in the Apocalypse of St. John might be cited as examples. Whether or not there may be realities of which the luxuriant imagery of the Book of Revelation is symbolical, is a question open to debate, but it is perfectly obvious that, while as wholes these descriptions do not raise cognitions corresponding to experience, they are composed of elements which experience affords. The parts of the pictures are parts of remembered experiences; the terms used to describe the wholes have primary reference to experience and derive their meaning from experience. The representative character of such cognitions thus appears plainly enough, and while it may be possible that what they image may *become* presentative, that they *are* immediate cognitions of realities, seen intuitively, cannot soberly be maintained for an instant.

Having now reviewed the several classes of cognitions, we have seen what are intuitions and what are not intuitions; and while no cognition is wholly intuition we have observed in what ones the intuitive character is sufficiently prevailing to warrant applying the name *intuition* to the whole. The poet says that "Knowledge is of things we see."* In these words, when properly interpreted, there is the soundest philosophy. I know of no more important reform required in the use of terms as affecting thought than the restoration of the words *intuition* and *intuitive* to their proper and original signification. It is a reform imperatively demanded. Unless they can be rescued from such uses as they are made to subserve when they designate general notions, they had better be discarded altogether. Undoubtedly some will contend, while conceding the primitive meaning of *intuition* and *intuitive* to be what is here set forth, that after all in practical use the words have become so modified as to make them the most suitable for expressing all fundamental truth. When a word has acquired a fixed signification, even though that be quite a different one from its earlier denotation or connotation, it is often better, these people would say, to accept the situation than to try to restore what has been lost. Often, but not always—and while remark of this kind would be quite true in many cases, it is nevertheless not pertinent to the present one. If no reform were made, but the evil practice of which I am complaining were to become universal, there would still be need of a distinction to be drawn between presentative knowledge and that of representation, and the application of the term *immediate* to presentative knowledge would be likely still to continue. Unless then it can be restricted to presentative knowledge an entanglement of meanings is inevitable, for we could scarcely divest *intuition* of its meaning of immediateness. We should all the time, therefore, be confusing presentative with representative knowledge, but the distinction between the two lies at the foundation of all scientific classification of products of the intellect, and to obliterate it or confuse it is to destroy or confuse the very science of knowledge. It would be far easier hence to confine the words in question to their obvious and primary meaning than otherwise to avoid the confusion and trouble sure to result from extending them beyond this sphere of application. It is certainly worth our while, therefore, to endeavour to suppress the illegitimate employment of which I have spoken. It may be suspected that men—not understanding the nature of belief and not regarding belief as conveying certitude equally with knowledge, feeling that there are certain truths necessary and universal and apprehending also that presentative cognition is vivid, certain and indisputable—have, in order to convey and secure the impression that those necessary truths are equally vivid and certain, appropriated the terms *intuitive* and *intuition* from their reference to presentative knowledge, to characterise the others. If, however, the mind can be led to see that we may be as certain of what we believe as of what we know, and that a truth may be necessary and universal without being intuitive, we shall perhaps find it less of a task to persuade people to relegate the name *intuition* and its kindred adjective to their original and only justifiable use of designating cognitions which are characteristically presentative.

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* Tennyson: *In Memoriam.*

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DANIEL GREENLEAF THOMSON.

V.—THE NEGATIVE CHARACTER OF LOGIC.

Amongst the difficulties which a student of Logic has to encounter, it will be generally admitted that one of the most persistent and perplexing is that of keeping steadily in view the exact nature and limits of his own inquiry. Certain other sciences—especially Psychology and Metaphysic—are so closely related to Logic, correct answers to their questions are so important to it, that in spite of the greatest possible care there must always be considerable danger of confusion.

At present, however, the danger, instead of being met and fought against, is rather overlooked. Our great authorities, in treating of the subject, fall into the oversight so often committed by those whose early difficulties are past and forgotten, of disregarding the difficulties of beginners. A statement of the province of Logic is usually found either in the introduction alone, or in the appendix also, to a work on the subject: the limits of the inquiry are discussed once for all and the results of the discussion thrown into the form of a neat definition, and then the student is supposed to be fully equipped for his task. During the rest of his progress he will receive little or no direct help in keeping those limits clearly before him. The teacher, feeling himself safe, does not realise how near the danger is to the pupil: he forgets that his own feeling of safety is, so far as it is at all justified, in a great measure due to a multitude of past victories of which that definition is to him an artificial memory; while to the pupil it is only an abbreviated register, carrying far less meaning in the first place, and in the second place demanding for the remembrance of that meaning an appeal not to past personal experience, but to sympathy and faith.

It is not, then, against the *correctness* of such definitions as 'the Art and Science of Reasoning,' or 'the Science of Evidence,' that any objection will here be raised, nor even against their utility for some who are already masters of the science; but against their utility for beginners, and in fact for all who have not (literally or metaphorically) lived through the process of creating them. I would suggest that the student might with advantage be provided with some map calculated to warn him away more unmistakeably from the borderlands, some definition which should direct his attention more centrally on his own science; until the habit of voluntarily concentrating himself on his own work and of answering, in the name of Logic, only logical questions, has become to him a second nature.

It is here contended that the chief danger to beginners is that of habitually conceiving the science of Logic in a too *positive* aspect. And the more enthusiastic and eager they are for the study, perhaps the more is this error likely to entice them. They are constantly forgetting that Logic is—to use Mill's excellent simile—only a judge: they fail to distinguish clearly between the functions of legislature, judge, counsel, solicitors, witnesses, and plaintiff or defendant.

Now, neither the definition 'Science of Reasoning,' nor 'Science of Evidence' is of any value in keeping this most important distinction prominent: other persons besides the judge are supposed to make some use of 'reason'; 'evidence' has to be not only sifted, but also found and produced. But it is distinctly the *sifting* of evidence that Logic properly attempts: the discovery, not of valid arguments, not of true conclusions, but of the validity or invalidity of given arguments to prove the truth of given conclusions. The function of Logic is to sit still and weigh evidence already produced, not to run abroad and find it: to distinguish, amongst arguments already urged, the good from the bad, not itself to aim at reaching a conclusion; to discover not the whole truth of any question raised, but only such truth as is proved by the evidence before the court; not necessarily to emerge from 'unknown' into 'known,' but to make sure at least of not emerging into certain particular forms of 'mistaken'. Logic is only a *supplementary* engine of discovery: not the well from which Truth is drawn, but the filter through which the natural and impure fluid must run, and cast off its impurities, before becoming of the best use to us.

It cannot, of course, be asserted that no reference to this fact is to be found in our leading works on Logic. Mill has already furnished us with the simile of the judge; and for half a page or more, in his Introduction, he enlarges the expression, turning it round on all sides, and emphasising it with his usual happy command of language. In many scattered passages too, throughout his book, he stretches out a hand to hold us back from at least one kind of questions extra-logical.

And most other writers on the subject have, in one way or another, recognised this limitation of their field. As Logic is "the common ground on which the partisans of Hartley and of Reid, of Locke and of Kant, may meet and join hands," so this view of Logic is one in which Material, Formal, and Conceptualist Logicians do actually agree: the only difference on the point—and that an individual rather than a party one—consisting in the different degrees of persistency with which the view is held. Logicians are not divided into those who admit the truth of the view and those who deny it, but into those who often, and those who seldom, remember it or care to make it known. Where even our best modern text-books chiefly fail, is in treating *us* too much as if we had already learnt the fact; and, whether because of the very absence of opposition, or for some other reason, the student is certainly credited with more knowledge of his province than he actually possesses.

Now there are two obvious methods in which a person may distinguish accurately between good arguments and bad. He may either pay more attention to the marks of valid or to those of invalid evidence: and having learnt the marks of either, he may apply his test to any evidence brought before him; and with equally certain, and equally valuable, results.

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At present the former method is the one most in vogue. The main portion of all our leading modern works on Logic is devoted to the marks of valid, or fruitful evidence. Fallacies are relegated to a book by themselves, after the chief labour of the system is completed: even the mention of them is introduced more or less apologetically, as a necessary sacrifice to old customs. Mill, for instance, gives to the practice of devoting "one considerable section" to the subject, the faint praise of being "too well worthy of observance to allow of our departing from it"; and in a later passage he says that it is "*not unimportant* to consider what are the most common modes of bad reasoning". Bain tells us distinctly that the whole of the second, third, and fourth classes in Mill's table of Fallacies "might *with the utmost propriety* be absorbed into the body of the work," and that the only plea which can be urged for mentioning the first and fifth classes, *as* Fallacies, is the difficulty of treating them from the positive side, under either of the heads, Deduction or Induction. "Some doubts," he adds, "might be raised as to the logician's title or obligation to enter upon the subject, but there could be none as to his allocating a distinct chapter to the consideration of it."

This plan of 'absorbing' as many fallacies as possible, and hiding the rest away in a corner, appears to me misleading. The directly contrary plan is the one here proposed.

Contrariorum eadem est scientia, and at first sight it might seem immaterial which of these methods we follow. Whether we separate the bad arguments from the good, or the good from the bad, the separation takes place equally: and this, as we have just said, is the whole duty of logicians. Even further, it has been plausibly argued that the negative 'not-valid,' like all negatives, covers an infinite number of possibilities, and that therefore its marks are not so definite as are those of valid evidence, and the individuals belonging to the class cannot be so exhaustively catalogued. We will take the latter of these objections first.

To say that because the class of not-valid arguments is numerically larger than the class of valid ones, therefore its marks are less definite, is to fall into the old error of supposing that classes are made first, and class-marks discovered afterwards; and to suppose that the marks of invalid evidence are at all less easily discovered than those of valid, is to overlook the Principle of Relativity. It is true that arguments vitiated to some extent by some fallacy or other, are potentially an infinite class, and in actual life are far more often met with than arguments perfectly sound in every part: but on this account we have more, not less, experience of the individual members of the former class, greater, not less, acquaintance with them. The point is, however, in this place at least, immaterial: what we are here concerned with is the fact that it is exactly *as* easy, neither more nor less, to decide that a given argument does not, as that it does, prove a given conclusion. The extent of our knowledge of the one truth is the measure of our knowledge of the other: for 'the other' is in strictness only 'the same in different words'. Whenever we have reason to know one truth, we have reason to know its counterpart. The infinity of the possible forms of error does not mean an infinity of marks: it is nothing more than the infinity which belongs to every class denoted by a general name.

As regards the objection that it makes no matter whether we search in the mixed heap of arguments for the good or for the bad, so long as we do make the separation, it is perfectly true but beside the point. We are looking now for some means of confining the logician's attention to the given heap, not only for a means of enabling him to sift the heap when he has already learnt that that is what he has to do. We cannot indeed *know* the marks of bad evidence without at the same time knowing, by implication, the marks of that which is good; but we can *search directly* for the one, and thereby search only indirectly for the other. We can cultivate, in short, one or the other of two distinctly contrary habits of thought.

Now the decision whether we shall habitually search for bad or for good evidence, will be found, I think, to make an important difference in the results attained. Owing, probably, to the 'inherent activity' of human nature, those who look upon Logic as the science of (positive) evidence—who habitually search for the marks of valid arguments—are as a matter of fact extremely apt to run outside such evidence as is brought to them for judgment, into the infinite field of that which may possibly be found: in other words, to take upon themselves the work of searching for evidence, as well as the judging of it when produced. By means of this 'positive' habit of mind, the student is often led to think that his duty as logician is not only to discover which amongst given arguments are safe from all known forms of error, but that he is bound to do more—to exhaust the universe of possible arguments, and to tell us, without the help of gradual elimination, which out of an infinite possible number are true. From this habit hardly any logician is quite as free as he might be, and to it we may trace, more or less directly, a good deal of the distrust and disfavour with which the science is popularly viewed. To revert to Mill's simile, the people would have a strong objection to a judge who neglected his own duty through taking upon himself the functions of some other person,—especially if he claimed to perform this extraneous work with judicial authority. Is it not at least possible that the habit of viewing Logic from the negative side would have a strong tendency to control this wandering, and to bind the mind down to the examination of a definite amount of evidence?

It is not, however, only to the beginner *quâ* beginner that the negative method of studying Logic will be useful, for it is in this shape chiefly—as the enemy of Fallacy—that Logic can be most readily and suitably applied in actual life. As we have already remarked, the great majority of arguments daily met with are far from being perfectly sound and valid. Fallacy, in some shape or other, meets us at every step. The actual work which any one who tries to apply Logic, whether in everyday life or in science, will find himself chiefly engaged upon, is that of continually refusing to accept rash assertions rather than admitting safe ones; guarding and waiting rather than striking or discovering. Logic is, from the nature of the surroundings, essentially negative in its most practical application; and the positive method of studying it, even if the special dangers be avoided, is wasteful of time in translation for daily use. To discover fallacies, to reject false arguments, to eliminate definite errors from infinite possibilities of error, is the essence of the application of Logic. Discretion is our motto rather than valour.

What, then, exactly, is the remedy proposed?

In the first place, a definition might be framed, with very little alteration of the best existing definitions, and yet so as to make the essential negativeness of Logic far more prominent. Instead of the 'Art and Science of Reasoning,' we might say the Art and Science of *guarding* Reasoning; instead of the Science of Evidence, the Science of *sifting* (or filtering) Evidence; simplest and least mistakeable of all, perhaps, would be the Science of avoiding Fallacy.

In the second place, the whole subject might be treated from the negative side. We might study the science of sifting evidence by first learning directly the marks by which to distinguish individual *fallacies* amongst a mixed mass of evidence, good and bad—just as, if we are filter-makers, we pay attention to the means for detaining impurities, and let others search for the purest water they can find. A whole system of Logic might be arranged, with the avowed intention of keeping this purpose continually in view; and, if the subject were treated at all, we might set apart, in a few chapters at the end, a list of rules for finding sound arguments by any other means than elimination, as a gift, extralogical, to such as are then ready to leave the study of Logic, and proceed into some other special science.

Throughout the system two facts should be kept ready for immediate production whenever there is a suspicion of their being wanted: first, that Logic has a certain really useful function to perform; and secondly, that that function is the cleansing of evidence, not the production of it: that the duty of Logic is not itself necessarily to prove anything, but to wait until some one else, or one's positive self, professes to have done so, and then examine whether that profession is correct: that the question which Logic attempts to answer is not "What is the fact of the matter?" but "What right has the speaker to say '*Therefore* such and such is the fact'?" Can any better plan be suggested than to cultivate a negative, impartial, judicial frame of mind, a habit of directing the attention not so much towards the possibility of establishing a given conclusion, as towards the discovery, by gradual elimination, of the conclusion, *if any*, which may already claim to have been established? We must be prepared, when necessary, to admit without a struggle that up to a given moment *no* conclusion has been established on either side. Often there will be a presumptive conclusion, but sometimes not even that. Let the logician when sitting as logician, like the judge when sitting as judge, feel neither the State's obligation nor the suitor's desire to reach *some conclusion or other*, and he will be rendering better service both to State and individual than if he attempts to do more than his allotted share of the work, while the public have penetration enough to recognise this fact, and to feel more respect for the logician's office when it is neither used as a cloak for usurping supreme authority, nor degraded and wasted by attending in person to work which can be more economically, and probably even better, done by deputy.

It must not be supposed, however, that the negative treatment of the subject will be *pure* gain. No doubt there are pitfalls and chances of error in this plan of study as in any other. I only maintain that its dangers are on the whole fewer, less serious, and more easily avoided than those produced by the method usually adopted. They may be, in fact, all traced up to one error, and that error combated by means of a full preliminary explanation of the true meaning (in this connexion) of the term 'negative'. As soon as the student has mastered the fact that on the one hand this change in the treatment of the subject is no material innovation—that none of the truths already discovered in Logic are in any way materially affected, or their truth diminished, by being viewed from the reverse side; and on the other hand, that Logic is none the less a valuable science because essentially a negative one,—he will be guarded against all the dangers which are likely to befall him: and to make these two points clear can surely be no hard task.

A few years ago, there appeared a leader in the *Times*, on the subject of railway brakes, stating with evident seriousness that a brake which only slackened the speed of the wheels was more efficacious than one which stopped them altogether, because in the former case the wheels were an *active element* in the stoppage of the train. It is not often, of course, that we find the fallacy so nakedly and grossly stated, but still there is a widespread undercurrent of a notion that what is stationary is *not effective:* and it might be useful at the outset to render impossible for ever in the future, in any shape whatever, this false use of the word 'negative' to imply uselessness. The best way, perhaps, would be to show in their true light both the hasty generalisation and the verbal ambiguity, from one or other of which the mistake certainly springs: to point out that the name is properly applied here not in its possible meaning of opposition to the wide positive which includes the narrower positive-negative pair, but in this narrower meaning itself: and to remind the reader that in this narrower meaning it is a great over-generalisation to say that what is negative is useless. There are occasions when standing still is the best thing we can do, and in the hasty inferences which take place in actual life, these occasions occur often enough to render a purely precautionary science useful. In our reasonings the spur and the whip are already supplied in profusion; what we chiefly need is reins. Our natural tendency is to generalise, to infer, to believe, on the smallest provocation. There is water everywhere, and although it would be an exaggeration to say that not a drop is fit to drink, yet we are all continually swallowing a good deal that is hardly clear. The utility, then, is manifest, of paying serious attention to our filter; of making the detection of the different kinds of Fallacy the framework of the study of Logic. Directness in application, as well as steadiness of aim, will be the clear result.

The following rough outline will sufficiently explain the proposed treatment:—

At the top of our filter, where the arguments are first poured in, might be placed a layer of material competent to detain those forms of error which are most dangerous, or most frequent: lower down might come, in regular order, means of absorbing forms which are less to be feared. Thus, Fallacies of Confusion will occupy the chief position, *Ignoratio Elenchi* (including all kinds of verbal ambiguity) being at their head: next in importance will come *Petitio Principii*, including some forms, such as Platitude, ὕστερον πρότερον, and Occult Causes, not usually classed along with it: and last, as least widespread and dangerous, will come such of the Fallacies of Ratiocination as remain over when Confusion has been subtracted. The treatment of Inductive Fallacies is, of course, the most difficult part of the work. It will be found that Mill's *à priori* class are in reality a part of these, and a decidedly puzzling class to fight against effectively; since they, even more than Fallacies of Confusion, hate the light, and wander in obscure corners of the mind, returning often, as ghosts, long after their substantial forms are dead and buried. Moreover, it must always be impossible to fix the exact point at which a theory shall first be considered proved, an Induction complete and sound.

But we shall find that by far the large majority of arguments are purified long before they reach even the second layer. In nearly every case where a difference of opinion appears to exist, such difference is not so large or so important as the disputers think: but what is large is their misunderstanding of the true question at issue. When that point is once definitely settled, the fiercest opponents generally become polite.

Three main questions stand out prominently whenever a doubt arises:—(1) What is the point at issue? (2) What is the evidence asserted? (3) What is the answer which that evidence allows? By dividing and subdividing these three questions, a complete list of all possible kinds of logical Fallacy would be drawn up.

ALFRED SIDGWICK.

VI.—BUTLER'S ETHICAL SYSTEM.

Probably no writer on Ethics has ever had so large a number of professed followers as Bishop Butler, and he is still regarded by many as having left behind him a system of Ethics which is in substance complete, and admits of little or no improvement save in the mode of exposition. I do not doubt or deny that he possesses many merits as an ethical theorist, while in the department of practical Ethics he will usually be found a safe guide. But it is a totally different question whether he has placed the Science of Ethics upon a safe and durable basis, and it is to that point mainly that the following remarks will be confined. Butler cannot, of course, be blamed for not taking into consideration the Association or Evolution Theories of the origin of the Moral Sentiments. They were not before him when he wrote, and in the hands of some of their advocates, at least, they do not affect the questions of Moral Obligation or Immutable Morality at all. With such writers these theories belong to Psychology not to Ethics, and it is therefore surprising that Sir James Mackintosh, for example, should have regarded it as a defect in Butler's system that he did not enter into an exposition of the Association Theory. That theory as expounded by Mackintosh leaves the real questions of Ethics exactly where it found them, and any interest it has is purely psychological.

"There are two ways," says Butler in the Preface to his *Sermons*, "in which the subject of morals may be treated. One begins by inquiring into the abstract relations of things, the other from a matter of fact, namely, what the particular nature of man is, its several parts, their economy or constitution, from whence it proceeds to determine what course of life it is which is correspondent to this whole nature. In the former method the conclusion is expressed thus, that vice is contrary to the nature and constitution of things; in the latter, that it is a violation or breaking in upon our own nature." As Butler chiefly proceeds upon this latter method, I shall consider it first.

Human nature, according to Butler, is a "system, constitution, or economy," which is thus explained. "It is one or a whole made up of several parts, but yet the several parts, even considered as a whole, do not complete the idea unless you include the relations and respects which those parts have to each other." But even this is not all, for he proceeds to say that "as every particular thing, both natural and artificial is for some use or purpose *out of and beyond itself*, we may add to what has been brought into the idea of a system, its conduciveness to one or more ends". Merely calling attention for the present to the words I have italicised, I pass to his illustrations. First he instances a watch: I need not dilate upon the parts and their relations. The end is to keep time, which is plainly not an object to the watch itself, but to the maker or owner. The second is Human Nature. The parts here are—"appetites, passions, affections, and the principle of reflection," which last is afterwards identified with Conscience or the moral faculty. Then come the relations of the parts to each other, "the chief of which is the authority" (elsewhere called supremacy) "of reflection or conscience". Lastly, we have the end. From the very structure of the system it is plain that virtue is the end to which it is directed. Virtue consists in obeying one's conscience. The superiority of conscience to all the other principles in human nature is, as Butler says in a note to the Third Sermon, "the chief respect which forms the constitution," and hence the constitution is adapted to virtue. It is no objection to this that all men do not in fact become virtuous. Every work of art is liable to be out of order. The watch may go fast, or slow, or stop altogether, without ceasing to be a watch. If it be answered that this doctrine represents the Deity in the light of an unskilful watchmaker, or an owner who did not know how to alter or mend his watch, it is not difficult to see what Butler's reply would be. Virtue is a voluntary act, or a series of voluntary acts, and the will is free. There could be no virtue without free-will and free-will implies the possibility of vice. Admitting this to be true, it brings out one important point, in which the analogy to a watch, or any other work of art fails; and this Butler digresses from his main object to insist on. "Our constitution," says he, "is put in our own power. We are charged with it and accountable for any disorder or violation of it." Charged with it by whom? Accountable to whom for any disorder in it? Plainly to the maker of it, who organised it for "a purpose out of and beyond itself". I shall return to this point; but in the meanwhile I may remark that there is another important respect in which the analogy fails. The parts of a watch or any other work of art are physically separable, and capable of independent existence. But the notion that the various faculties, appetites, and passions of the mind are so many distinct entities existing in the mind, has long since been exploded. The whole mind thinks, remembers, loves, fears, wills, and judges. Hence when we speak of the supremacy of conscience or of any other part or faculty of the mind over the other parts, our language is metaphorical only and not literal, as it would be in speaking of works of art. In a strictly scientific work such metaphors should be laid aside, and the doctrine expounded in terms that do not even apparently involve the supposition of faculties existing as separate entities. I presume this could be done with Butler's theory of the Supremacy of Conscience, but I have found such difficulty in doing it that I think it wiser to leave that task to some more ardent disciple. Again, how is the Freedom of the Will involved in the Supremacy of Conscience; and if not, how can it be imported into the notion of virtue? Butler might perhaps answer that virtue consists in a series of efforts of free-will aiming at giving conscience in fact that supremacy which God intended that it should have; but if such was the intention of the Deity, would it not have been more effectually accomplished by abolishing free-will and making conscience necessarily supreme in all cases? Here we are trenching on the old question of the origin and permission of evil; but I think Butler was bound to give further explanations on this subject.

To resume. In the beginning of the Second Sermon, Butler gives a further exposition of this method. "If the real nature of any creature leads him, and is adapted to such and such purposes only or more than any other, this is a reason to believe that the Author of that nature intended it for those purposes;" to which he goes on to add that the more complex the constitution is "the stronger is the proof that such end was designed". Here nothing is proved, except that God designed virtue as the end of Human Nature considered as a system or constitution. It is true that Butler speaks of the perfection of such a system both in the *Sermons* and the *Analogy*. But this by no means identifies his system with those in which Perfection is represented as the end of morals; for the only perfection of which Butler speaks, is perfection as an instrument—perfection in reference to the end "out of and beyond itself," for which the Author of the system intended it. "The most exact proportion possible," he tells us (*Analogy*, part i., ch. 5), is that "most exactly adopted to the intended state of life," and the main purpose for which our lives are intended is the practice of virtue. But the question immediately arises, Why should I seek to accomplish the end for which my Maker designed my constitution? The answer must either be, because it is right, or because by doing so I shall obtain the largest amount of pleasure, and the least amount of pain for myself. Possibly a firm believer in the Divine Benevolence as Butler was (at least in his *Sermons*) might reply, because by doing so I shall benefit mankind at large most effectually. I presume no one would answer, because my inclination to do so is stronger than the contrary inclinations. Butler at all events could not, because a large proportion of what he has written is directed against yielding indiscriminately to the strongest inclinations.

Turning then to the other answers, if we adopt the first, what has been the use of this whole argument from the constitution of human nature, final causes and the will of the Deity? The only test of what is right in this system is that conscience tells me so, and I might as well have appealed to the oracle at first as at last. Then whatever conscience tells me, it tells me with equal authority, and unless it commands nothing except to carry out the will of the Deity, as manifested in the structure of the human constitution, it cannot be the sole rule of morality to carry out this one command. The other two answers are equally unsatisfactory. I have various other ways of estimating the probable result of my actions as regards pleasure and pain, and if to obtain the former and to avoid the latter is to be my ultimate aim, why am I to neglect these? and the same thing may be said of my endeavours to promote the happiness of others. Finally, if our only reason for acting virtuously is that virtue is the end to which God has adapted the human constitution, whatever answer I may give to the question, Why am I bound to carry out the wishes of the Deity? the same answer would apply to every other instance in which the Divine Will is manifested to us, whether by the voice of nature or by revelation. Therefore the great moral rule should not be to carry out the Divine Will as manifested in our constitution, but to obey the Divine Will generally. And Butler himself (in his *Analogy)* treats the foreseen pleasures and pains which are the consequences of our voluntary actions as instances of divine rewards and punishments. If so, we should pay as much regard to them as to the development of our constitution in the direction indicated by its designer.

Accordingly when Butler comes to deal with the question of Moral Obligation, his treatment of it is by no means satisfactory. Man, he tells us, is by nature a law to himself, independently of rewards and punishments. This is not very definite. "Your obligation to obey this law is its being the law of your nature. That your conscience approves of and attests to such a course of action, is itself alone an obligation." Here apparently morality is set up on a basis independent of the Deity and of His design in framing the human constitution—in which case all that has been written about that constitution is so much waste paper, and Butler's second ethical method is abandoned. But he goes on: "Conscience does not only offer itself to show us the way we should walk in, but likewise carries its own authority with it, that it is our natural guide, the guide assigned to us by the Author of our nature". Here we get back again to the Deity; and it is impossible to ascertain whether Butler's answer to the question, Why am I bound to be virtuous?

is because it is right, or because God commands it. Moreover, it is impossible to found an immutable morality binding on all rational beings, upon the design with which the Deity framed the human constitution. "Though," says Butler, in a note to the Twelfth Sermon, "the good of the creation be the only end of the Author of it, yet he may have laid us under particular obligations, which we may discern and feel ourselves under, quite distinct from a perception that the observance or violation of them is for the happiness or misery of our fellow-creatures. And this is in fact the case; for there are certain dispositions of mind, and certain actions which are in themselves approved or disapproved by mankind abstracted from the consideration of their tendency to the happiness or misery of the world—approved or disapproved by reflection, by that principle within which is the guide of life, the judge of right and wrong;" of which he goes on to give several instances.* His explanation is, that as we are not competent judges of what is on the whole for the good of the world, the Deity appointed these immediate ends for us to pursue to supply the want of broader views and a more matured judgment. The virtues which he mentions, as instances—fidelity, honour, and strict justice—are not then good in themselves, but only good in relation to a further end, *viz.*, the general happiness of all creation. But conscience judges them to be right in themselves without any reference to this further end, and indeed without seeing it at all. It is plain then that the rectitude of an act (as judged of by conscience, which is Butler's only criterion), is not any absolute property of the act itself, and that acts which we judge to be right in themselves, would from the point of view of a higher order of rational beings, possess no such quality, but be merely useful as a means. Indeed some actions of this kind might even prove to be wrong; for it would be going pretty far to lay down that by pursuing these immediate ends we *invariably* contribute to the ultimate end. That is not the character of any known empirical law. If the immediate end keeps us straight in ninety-nine instances out of a hundred, it is a very good substitute for ignorance and groping in the dark; but what then becomes of Immutable Morality?

Here are difficulties enough and difficulties which seem applicable to any ethical theory that could be based on the second of Butler's methods. But in addition to this, Butler vacillates in his account of the human constitution itself. We have seen him declaring that conscience has a natural superiority over all the other principles of our nature; and that doctrine is frequently repeated in his pages.* This idea of the superiority of one faculty to another, where the former evidently is not the most powerful (at least in some men), being new, Butler lays hold of another instance to make it more intelligible to his readers—the superiority of self-love to natural propension. He might of course have said that, while superior to the lower parts of our nature, self-love was it self subject to the supremacy of conscience, but he does not say so. He stops at the point, "Reasonable self-love and conscience are the chief or superior principles in the nature of man, because an action may be suitable to this nature, though all other principles be violated, but becomes unsuitable if either of these is". It seems to me that the causal relation of the two parts of this sentence has been reversed; but at all events we have now got two chief or superior principles instead of one, and the original argument that virtue was the end for which our nature was designed, is in danger of being invalidated by the introduction of the second superior principle. Butler's mode of evading the difficulty is as follows: "Duty and interest are perfectly coincident, for the most part in this world, but entirely, and in every instance, if we take in the future and the whole, this being implied in the notion of a good and perfect administration of things". That is a practical, perhaps, but not a theoretical solution of the problem, and it is only satisfactory to a theist and a believer in a future life. But Ethics is a science intended for every one, and which it is desirable to keep clear of theology as far as possible. This indeed on the method on which I am now commenting cannot be done, for the whole argument turns on the supposition that the human constitution was framed by some one who had a particular end in view in framing it. Nevertheless, Butler is anxious to make his principle of the Supremacy of Conscience applicable to the case of a sceptic or an atheist. He deals accordingly with that case, in connexion with Shaftesbury, in his Preface. It may *seem*, no doubt, says he, if I am not a believer in a future life and a moral government of the world, that in some particular instances it will be for my interest to disobey my conscience; but I never can be *quite sure* that it will be so, because the results of my actions as to pleasure and pain can only be foreseen with probability, not with certainty. Now the obligation to obey my conscience is absolutely certain and known; therefore, this "certain obligation would entirely supersede and destroy the uncertain one, which yet would have been of real force without the former".* But probabilities sometimes rise so near the level of certainty, that for all practical purposes there is no distinction between them; and if the obligation to self-love be really the higher or superior obligation, it surely ought, when made out to a high degree of probability, to be suffered to determine the will. That there are exceptions to the happiness of virtue in this world, Butler himself maintains (*Analogy*, part i., ch. 3); and surely, in the case on which he principally insists, it could be foreseen and predicted with very considerable confidence, that it would not be for the happiness of vicious men (in this world) to reform. But suppose the (probable) obligation to act viciously from self-love remains, what is the consequence? We should then, says Butler, be "under two contrary obligations, *i.e.*, none at all". Yes, if the two were of equal strength, or rather of equal authority; but are they? Butler himself tells us the contrary. "It may be allowed," he says, in his Eleventh Sermon, "without any prejudice to the cause of virtue and religion, that our ideas of happiness and misery are of all our ideas the nearest and most important to us; that they will, nay, if you please, that they ought to prevail over those of order and beauty, and harmony, and proportion,† if there even should be, as it is impossible there ever should be, any inconsistence between them; though these last, too, as expressing the fitness of actions, are as real as truth itself. Let it be allowed, though virtue and moral rectitude does indeed consist in affection to and pursuit of what is right and good as such, yet, that when we sit down in a cool hour, we can neither justify to ourselves, this or any other pursuit, till we are convinced that it will be for our happiness, or at least not contrary to it." The concluding words no doubt save the system from falling into complete selfishness. We are under an obligation to obey our conscience in cases (if there be any) where we shall neither gain nor lose upon the whole by so doing; but still I can hardly see how the foregoing passage can be reconciled either with Butler's supposed cardinal doctrine of the Supremacy of Conscience, or with his argument in favour of virtue from the consideration of the human constitution and the end for which it was designed by its author.

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* See too the passage from the Essay on Virtue, which is quoted further on in this paper.

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* When we meet with such phrases as, "Had it strength as it has right, had it power as it has manifest authority, it would absolutely govern the world," we may ask who tells us that it has right or authority in the sense in which that word is opposed to power? The answer is clearly, The moral faculty itself tells us so. But in that case what faculty informs us of the superiority of self-love?

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* Butler in this passage speaks of the obligation to conscience as being "the most near and intimate," but he makes no use of this phrase afterwards, and decides the question on the issue of certainty *versus* probability only.

† The whole context shows that Butler means to identify these terms with rectitude and virtue, which certainly does not look very like a doctrine of Immutable Morality.

There are some expressions in the Sermon last cited also, which might lead us to think that Benevolence, no less than Conscience and Self-love, was a superior principle in human nature, while the Thirteenth and Fourteenth Sermons might lead us to ascribe a like character to the Love of God; but I do not intend to enlarge on minor inconsistencies, if inconsistencies they be. I may also notice a mode of getting over the difficulty of two superior principles, which turns up incidentally in the Essay on the Nature of Virtue appended to the *Analogy*. It is there maintained, that "the faculty within us which is the judge of actions,"—that is unmistakeably the principle of reflection or conscience of the *Sermons*—"approves of prudent *actions* and disapproves imprudent ones as such, and considered distinctly from the happiness or misery which they may occasion". If this be so, it might be contended that self-love was not of itself a superior principle in human nature, but that its superiority consisted in this, that Conscience—the true supreme principle—approved of actions directed towards its gratification. But Butler has nowhere said that this reflected supremacy is the sole superiority which self-love possesses over the lower passions, and in some of the passages already referred to he says the reverse. In fact, in the *Sermons* he made use of the superiority of self-love to illustrate that of conscience, as being the more evident of the two. Again, in the *Analogy* itself, he maintains that there are exceptions to the happiness of virtue in this world, and of course in such cases prudence would lead a man who disbelieved in a future state to act viciously, *i.e.*, to do what conscience disapproves of. Hence it appears that, if conscience does approve of prudent actions as such, it can only be under the condition that they are consistent with the three other cardinal virtues of Butler, "justice, veracity, and regard to the common good". When the prudent action conflicts with these, conscience disapproves of it, notwithstanding that is seen to be prudent; and, therefore, the conflict of the two superior principles is not removed. Butler, moreover, in this very Essay seems disposed to place prudence on a lower ground than the other virtues, contrary to the passage which I have quoted from the Eleventh Sermon. As a further instance of his vacillation on the subject, I may refer to his answer to the objection, "that so far as a course of behaviour materially virtuous, proceeds from hope and fear, so far it is only a discipline and strengthening of self-love"—in the fifth chapter of Part I. of the *Analogy* (where by the way he assumes that such a course *may* form virtuous habits, contrary to what he had already laid down in the same chapter). "Regard to our own chief interest" is there described as an essential element in a right character. Why? Because Conscience approves of it? Or because it proceeds from the other superior principle, Self-love? I do not think the passage supplies any answer.*

I turn then to Butler's second method, and here the phrase "the abstract relations of things" (borrowed probably from Clarke) is so indefinite in its meaning, that it is only to be understood by examining the special exemplifications of it that occur in the *Sermons*. Of these, I think there are but two, one in reference to compassion, and the other in reference to resentment. The first of these (Sermon VI.) commences—"To these considerations drawn from the nature of man, must be added the reason of the thing itself we are recommending, which accords to and shows the same;" and then follows a proof of the utility of exercising compassion with the conclusion—"So that it is not only true that our nature, *i.e.*, the voice of God within us," (this phrase frequently occurs in Butler and confirms my view, that the argument from the nature of man is really an appeal to theological considerations) "carries us to the exercise of charity and benevolence in the way of compassion or mercy, preferably to any other way; but we also manifestly discern more good done by the former or, if you will allow me the expressions, more misery annihilated and happiness created". The other application of the method occurs in the Ninth Sermon, in the paragraph commencing—"In showing the unlawfulness of revenge, it is not my present design to examine what is alleged in favour of it from the tyranny of custom and false honour, but only to consider the nature and reason of the thing itself"; and then follows an argument which aims at proving the greater utility of foregoing than enforcing vengeance on those who have injured us. The ethical method then, which starts from "the abstract relations of things," is simply that which starts from the principle of general utility; and the reason of the designation is explained by a passage in the Twelfth Sermon. "It might be added," writes Butler, in this paragraph, "that in a higher and more enlarged way of consideration, leaving out" (that is, abstracting from) "the particular nature of creatures, and the particular circumstances in which they are placed, benevolence seems in the strictest sense to include in it all that is good and worthy"; and he goes on to apply this to the Deity and higher orders of rational beings. But how are our obligations to virtue made out by proving its general utility, *i.e.*, that it benefits others?* If it be said that the moral faculty approves of benevolence, why not have appealed to this faculty at once? If all our obligations to virtue are to rest ultimately on the supremacy of conscience, what do we gain by proving that the course of which this faculty approves is either consonant to our nature considered as a system or constitution, or that it tends to the general benefit of mankind?

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* It may perhaps be thought that, in the foregoing discussion, I am in error in taking as Butler's definition of virtue, "a course of action of which conscience approves," and that the true definition is "a course of action suitable to our nature, considered as a system or constitution," or, as some of the ancients put it more briefly, "a life according to nature". I do not think that such is Butler's ordinary meaning of the term. He certainly frequently identifies it with that which the moral faculty approves, *e.g.*, where he says, in the Essay on the Nature of Virtue: "Nor is it at all doubtful in the general what course of action this faculty . . . approves or disapproves; for as much as it has been disputed wherein virtue consists . . . there is in reality an universally acknowledged standard of it." But suppose the contrary, and what is the result of Butler's ethical method? Simply, that starting from a definition of virtue different from the ordinary one (for that mankind in general mean by virtue that which they regard with moral approbation, seems to be incontestable), he arrives at the conclusion that the two definitions will coincide in result. Define virtue as that which accords with human nature as a constitution, and the question, What obligation am I under to act virtuously? remains as unanswered as before, I cannot discover that any such obligation can be derived from this notion of a constitution, whether referred to its Author or not. Yet the object of Butler's two methods, is to lead to "our *obligations* to the *practice* of virtue." (Preface to *Sermons*).

Both of Butler's ethical methods then leave us exactly where we began. Moral obligation must be at last taken *per saltum* as involved in the Supremacy of Conscience, of which (as Butler contends) we have a direct perception, and these preliminary discussions about human nature and uility only serve to keep the real point of the system out of sight. Moreover, according to Butler, this argument from the abstract relations of things does not lead to the practice of *all* virtue; for he is careful to tell us in a note to this Twelfth Sermon, which I have already quoted, that the moral faculty approves and disapproves of many actions, without any reflection on the benefit or injury which will result to mankind from their performance. There is an equally decisive passage in the Essay on Virtue:—"The fact then appears to be, that we are so constituted as to condemn falsehood, unprovoked violence, injustice, and to approve of benevolence to some preferably to others, abstracted from all consideration which conduct is likeliest to procure an overbalance of happiness or misery. And, therefore, were the Author of Nature to propose nothing to himself as an end but the production of happiness, were his moral character merely that of benevolence, yet ours is not so. Upon that supposition, indeed, the only reason of his giving us the above-mentioned approbation of benevolence to some persons rather than others, and disapprobation of falsehood, unprovoked violence and injustice, was that he foresaw this constitution of our nature would produce more happiness, than forming us with a temper of mere general benevolence. But still, since this is our constitution, falsehood, violence, injustice, must be vice in us, and benevolence to some preferably to others, virtue, abstracted from all consideration of the overbalance of good and evil which they may appear likely to produce." How is the argument from the abstract relations of things applicable here? It certainly is not the ground of approval or disapproval, and I cannot see how it is the ground of obligation. I have already noticed the bearing of such passages on the doctrine of Immutable Morality, which, notwithstanding, Butler unmistakeably upholds. Thus, in the concluding chapter of the *Analogy*, he tells us that he has omitted a thing of the utmost importance—"the moral fitness and unfitness of actions prior to all will whatever, which I apprehend as certainly to determine the Divine conduct, as speculative truth and falsehood necessarily determine the Divine judgment"; and then he gives the application of this principle to the subject before him thus: "There is in the nature of things an original standard of right and wrong, in actions independent of all will, but which unalterably determines the will of God to exercise that moral government over the world which religion teaches". But how can we attain to such a standard, or even learn its existence, if our moral approbation and disapprobation are mere matters of Divine appointment, the reasons of which are concealed from us?

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* How, moreover, is this method to be made consistent with the superiority elsewhere attributed by Butler to the principle of self-love, and with his doctrine that prudence is a virtue?

My conclusion is that neither of Butler's methods leads to anything, and that at the end of both he is compelled either to take moral obligation for granted, or else to abandon his methods and appeal to the moral consciousness directly—an appeal the force of which is weakened, not strengthened, by the process which leads up to it. Further, not only are his methods fruitless, but in attempting to work them out he falls into numerous inconsistencies, and in consequence his ethical system is in many respects incomplete, if not erroneous. He has no doubt left us some excellent observations and some valuable analyses; but the latter sometimes tell against him as well as in his favour. For instance, in distinguishing particular propensions from self-love, he says the difference becomes obvious as soon as we distinguish between the appetites themselves and "endeavouring after the means of their gratification". Now this seems to me to be exactly the distinction which the advocate of the Selfish System must make in order to give his principle any appearance of plausibility. If he maintained that the pain of hunger was the result of general self-love, he would make himself ridiculous; but he might contend, with some appearance of truth, that all our endeavours after the means of gratifying hunger (or any other passion) proceeded from his single principle. I have, however, already occupied so much space, that I shall not pursue this topic any farther.

W. H. S. MONCK.

VII.—POLITICAL ECONOMY AS A MORAL SCIENCE.

To those who are interested in Economic Science, few things are more noticeable than the small hold which it has upon the thoughts of our generation. Legislation has been directly influenced by it in the past, and the results of the application of its doctrines are manifest in every department of our laws; yet, in spite of its triumph in this region, we find a widespread tendency to look on its teaching with suspicion, whilst one of our greatest modern writers impugns its fundamental principles, month after month, with the applause of a large circle of cultivated readers. Petitions from various trading interests—as recently from the watchmakers—show that the mercantile public are not swayed by it; working-class leaders notoriously disregard it, and foreign statesmen do not pretend to listen to its preachings. Those who regard the teachings of the science as not only true but important truths, cannot ignore the general neglect into which it has fallen, and it behoves them to investigate the cause of it. When a case is argued fully, as that of Political Economy has been during the last century, and the listeners remain unconvinced, there seem to be only two possible alternatives—either that the statements are untrue, or that they have been badly expressed. The latter appears to me to be the true explanation, and this paper is not an attempt to establish any new doctrine, but only to express the old truths in a better way. It merely claims to delineate a new method of treatment, and indeed one that is not wholly new: at most it seeks to maintain consistently a point of view which has been fitfully adopted in popular treatises on the subject.

I.—*Various views of the Science.*

(a.) In its earliest beginnings, in the dark ages which preceded Bp. Berkeley, Hume and Adam Smith, Political Economy,

with its mercantile system, was a science of *things*. Value was supposed to be an intrinsic quality of certain objects; and a nation seemed to become rich by getting objects which possessed this quality in a high degree. All the ingenuity of the day was directed to the acquiring of valuable objects, at first by the somewhat crude method of compelling merchants to bring gold here and forbidding them to take it hence, till at length Sir Thomas Mun showed the shortsightedness of this policy, and explained how gold might be made to flow into the country. Then followed attempts to protect native industry, as the means for manipulating the exchanges and obtaining a large share of objects of high intrinsic value.

(b.) Though Adam Smith proved the untenableness of the old views, and dwelt on the fact that a nation which has many not-very-valuable things is richer than one which has a few very valuable ones, he hardly saw the true theory which, while implied in much of his teaching, was explicitly stated by Ricardo. Value is not a quality, but a relation—a relation between this object and desirable things in general. This being so, we cannot found our science on a mere consideration of *things:* we must look at that which gives a value to the things, and that is, the competition of actual owners and would-be owners. We have not to do with the mere practical usefulness of the objects, still less with intrinsic valuableness, but with a value which is conferred upon useful objects by the competition of various human beings who find difficulty in obtaining them.

It is thus that the questions of exchange have come to be fundamental ones in the science, since competition lies at the root of the notion of value. What J. S. Mill calls the "necessities created by social arrangements," has made exchange a fundamental fact in all the production of wealth. It is not wholly possible to distinguish the competition of man with man which drives most of us to work, from the competition of seller with seller which drives down price. The free flow of labour from one employment to another, the free flow of capital also, are assumptions which the doctrines of Ricardo involve: each individual human being is represented as the owner of something, of labour which he exchanges for sustenance, or wealth which he advances in return for the products of labour; by their competition with one another, the share of each competitor and the value of objects are determined. The ordinary doctrines of the school of Ricardo are expressed with some confusion in the popular text-books on the subject; to these we shall shortly revert. But with the view of exposing the inadequacy of this teaching it may be best to refer to it in the clear and consistent shape in which it has been worked out by Professor Jevons. He insists that Political Economy portrays the "mechanism of interests," and is properly a mathematical science, dealing with quantitative differences. Since each individual is swayed in his commercial transactions by considerations of utility, *i.e.*, by the anticipation of greater or less quantities of (high or low) pleasure, the ratio of exchange is said to be determined by the competition of various individuals or groups of individuals, guided solely by considerations of utility.

Numerous objections may be urged against the science when thus treated. One of the commonest is perhaps a sentimental one—that Political Economy is a science of selfishness; and though Professor Cairnes has repudiated this charge on the ground that the science is merely descriptive and does not enjoin any kind of conduct, the mode of treatment before us gives some colour for the ordinary view. Professor Jevons speaks of the science as if it were utilitarian; but only the cruder forms of Utilitarianism concern themselves solely with degrees of intensity; and our attention is concentrated on the motive—individual gain, rather than the end—the happiness of the greatest number. This gives economical teaching—when considered in its moral aspect—the appearance of mere Egoism; and Egoism, if speculatively justifiable, is repugnant to the popular consciousness. Most of the socialistic antagonism to ordinary Political Economy is due to the belief that it is at root egoistic, and has regard to the wealth of individuals at the expense of the well-being of the community.

But there are more weighty objections. Mr. Bagehot pointed out* that there have seldom been circumstances in the past history of the world when the conditions which are tacitly assumed by Ricardo have been present. The free play of competing interests, the free flow of capital to different channels and of labour to different employments, have had no place in the industrial condition of the great mass of mankind; for competition has rarely superseded the determination of the ratio of exchange by custom.

If the science, thus treated, is inapplicable to semi-civilised human beings, it is certainly defective as a representation of English industry to-day. Even in this country, the free action of competitive individualism is very considerably modified by other influences besides the remnants of feudal feeling. The presence of Trades' Unionism and its curious effects in modifying the character of competing groups is a case in point: not less marked are the interferences with the freedom of judgment of capitalists caused by the factory acts and similar legislation.

To these charges we may add one more: the teaching of the school of Ricardo is psychologically incorrect. The increase of pleasure and increase of pain may possibly be the motive of all human effort, but the forms under which it manifests itself are most diverse. The self-interest of the non-unionist is qualitatively different from that of the man who merges his own individual interest in that of his society: we cannot regard them as merely quantitatively distinct. Still more, the self-interest of the man who spends his days in incessant toil, is different in kind from that of the man who undergoes the privation of supplying his neighbour with the means of working. One man's estimate of pleasure and pain leads him to marry and settle down now, and remain a labourer all his days; another prefers to wait and save for years, and to rise to a better position eventually; but we cannot say that the man who rises in the world has a greater regard to pleasure and pain than the other: he is influenced by a different kind of enjoyment, and a different kind of privation; the motives which lead to labouring or to saving capital are different in kind, not merely in degree. If, as Mill contended, *axiomata media* are needed for utilitarian Ethics, they are equally necessary for utilitarian Political Economy. We cannot exhibit economical phenomena as the effects of different manifestations of *one* force which is applied with different degrees of intensity, but must regard them as due to the interaction of *many* forces which are qualitatively, not merely quantitatively, distinct. This attempt at unreal simplification appears to me to be the fundamental error which has given the science an immoral guise while limiting its scope. The distorted treatment has made Political Economy an inadequate science, even for our own day, rather than one which explains that development of industry which has accompanied the developing powers of man.

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* *Fortnightly Review*, 1876.

(c.) This attempt to review the methods of treatment that have proved unsatisfactory may have already pointed out the direction in which we must apply ourselves if we would discover a better. Economists have too long considered human beings as tending to act from one impulse, and have taken for granted that the external phenomena of wealth are due to this one invariable motive; they have thus been contented with examining the laws which may be observed among these external phenomena. But it may be a question whether the science has not been confined too exclusively to things outside us. In undergraduate days, one was sometimes struck with the wide difference between this and the other subjects which were grouped as Moral Sciences: it had indeed to do with human beings, but the whole character of the study was diverse, and there was a certain relief in turning from the hopeless bewilderment of various analyses of conscience to the absolute clearness of Ricardo's

Principles of Taxation. It may be doubted, however, whether this clearness is not attained by removing the difficulties before entering on the discussion. With the view of simplifying the problems, a pyschological assumption is made—more often tacitly than not—and a large number of lucid deductions are drawn. Might it not be better if Economy made less pretence to precision, and attended more carefully to the diverse activities of human nature? Political Economy has been a science of *things*, and discoursed of intrinsic value; it has been a science of *mechanism*, and explained the interaction of competing interests; may we not treat it as a moral science which considers *the resources of human nature for the satisfying of human wants?* Political Economy has to do with such of the resources—the activities and capacities—of human nature as are employed in the satisfying of human wants: it is not concerned with things as valuable in themselves—that delusion is done with forever—but with human powers working on things and giving them their worth: it has not to do with human atoms impelled by one force, but with the many powers which are common to all human beings, while they are more highly developed as civilisation advances. If this view of the subject removes the appearance of Egoism, it also gives the science a closer relation to actual life, both past and present. There may have been a state of society when practically, things had a fixed value, and the old thoughts were true; there have been signs of a time when there was no society and a competing individualism was the order of the day, and the doctrines of Ricardo represent the truth then. But our science need not be limited to any one of these conditions of mankind if it fixes its attention on the human powers that are at work in every stage of civilisation. Political Economy, as a Moral Science, may express general truths, while by other methods of treatment it is limited to special states of society and cut off from all relation to History.

II.—*General Principles.*

These considerations seem to establish a *primâ facie* case for at least some new method of treatment; and we may proceed to attempt a new presentation of old truths by delineating, very briefly, some leading doctrines in the form they would take as part of the science of the resources of human nature. To this view of the subject an objection at once occurs; we are concerned, not with thoughts and feelings—mental or moral powers—but with things. The growth of wealth implies changes in the material universe: it is for material wealth that men strive, and the resources of human nature may be very considerable, but they are not capable of filling a mouth, not to mention a pocket.

But though this is true, the fact remains that these material objects are not only valueless in-themselves, but useless in-themselves; they become useful from the fact that there is a man to use them. To one who does not know their use, they are worthless; and the increase of knowledge means, as Bacon saw, the increase of power over nature to turn material things to our uses. Things in-themselves have no place in our science; only material objects as known, and material objects as used. We do not need to cumber our discussion with any distinction between Mind and Matter, still less need we confuse it by trying to treat of both together: we shall include all that is needed for the study of the subject if we think of the resources of human nature, among which we may include its *knowledge* of nature and *inclination* to use it.

This may be a hard saying to those who have accepted the teaching of the common text-books; but we are not at issue with ordinary language, if we have gone beyond popular thought. A wealthy man is simply one who has many satisfactions, and the certain expectations of satisfactions to come: we may say that wealth consists of all pleasures present or expected which are embodied in a material form, rather than that it consists of "every commodity which has an exchange value". This is no mere quibble: so far as the latter statement is not a meaningless truism, it accentuates commodities rather than the feelings of human beings, which are the reasons of their worth. The thing in-itself has no value, only pleasure in the thing; and more than this, we buy or sell not merely the thing, but the expectation of pleasure embodied in the thing. When John and Thomas bargain as to a watch, there are at least as many possibilities of confusion as there are when they talk on other subjects.* There is John's expectation of the usefulness of the watch to him, there is Thomas's expectation of being able to get more from some one else: on both sides there are ideal elements, and the thing in-itself—the real watch—is only the centre round which these subjective expectations cluster: so, too, the disappointment of a bad purchase is due, not to any change in the commodity, but to finding that the actual pleasure does not come up to the expectation.

So long as we assert that wealth consists of commodities, so long will it be impossible to divest men wholly of the belief that value is an inherent quality of objects, or to enforce clear ideas of the nature of wealth. Wealth consists of satisfactions embodied in objects; and the distinction is important when we remember that many exchanged commodities are not themselves the embodiment of any pleasure, but rather of abstinence from

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Autocrat of the Breakfast Table.

enjoyment. The result of our toil—the satisfaction of our wants—is surely to be classed differently from the commodities which we merely use for producing that result: the one is but the means to an end, the other is the end itself—a distinction which is sufficiently recognised in the common view of a miser as one who makes his means an end. Commercial crises would bear one out in saying that capital invested in a business is not wealth unless it can be realised into a form which gives security for the satisfaction of wants. If we only talk about commodities we ignore the different functions which commodities are made to serve in accordance with human activity: our science, by attending merely to the embodiment, has neglected distinctions among the powers embodied; and it is with these activities that we propose to deal.

Energy. There is little difficulty in perceiving the influence which drives human beings to work: want is the occasion of all human energy, just as it forces the birds of the air and beasts of the field to spend weary hours in the pursuit of prey. The wants of the savage are scarcely greater than those of the animal,—only a little food and a little shelter,—yet the privation he endures and the drudgery he undergoes in his spasmodic and frequently relaxed efforts to obtain the necessaries of life, are immeasurably greater than those which are required to satisfy the wants of the civilised man in constant employment. The life of a North American Indian is not an easy one: it is one of wasted and misapplied exertion, and the greatest change in the civilisation of a tribe must occur, when they learn wisdom enough to devote themselves to regular work, and develop the mental quality we term *Energy*.

Patience. The capacity for regular work not only implies a growth of wisdom, but a development of other qualities as well. From no form of tillage, or other employment, can we obtain immediate results: in all of them we need *Patience* to wait, willingness to work now, for the gain of a distant day. It is partly because they have no capacity for waiting that the American Indians prefer a life of hunting and semi-starvation.

We may see, then, that before human beings can engage in any regular work at all, two things are absolutely necessary,—the Energy to engage in industry and a capacity for patient waiting. When either of these is wanting, there may be predatory or nomadic existence, but never any advance in the arts and comforts of life. Not less true is it that within all the various branches of our giant industry, these two factors are found: Labour in its countless forms is but the agent of intelligent industry, Capital is the representative of Patience, which is willing to wait for the results of work.

c. Appropriation. To these two factors in the satisfaction of want we may add a third: the recognition of the right of private property has been one of the most potent economical influences the world has ever seen. With the ground of that right, and the precise nature of that right, we have nothing to do: it may suffice to say that there was a time in most, if not all, settled Aryan villages, when communism and custom ruled the day, and that, so far as we see, no great expansion of industry was possible till this system yielded to that of private property. The recognition of this right affects both the factors we have already considered, for neither Energy nor Patience can fail to be stimulated by the expectation of appropriating the reward. Of course, Appropriation is implied in the satisfying of any wants; but it is only when society has developed to some extent that the influence of the 'desire of having' can be distinguished from that of physical needs and greeds. When we have thus added Appropriation as a stimulus to greater Energy and greater Patience, we seem to have given a sufficiently complete account of all the powers involved in the production of wealth.

Our account of the matter has certainly differed from that of the popular text-books which insist on *labour, capital,* and *land,* as the requisites of production. That analysis has a suspicious appearance of being drawn from the three classes of our community rather than from a scientific consideration of the case. Besides, the classification is very liable to be misunderstood. To the socialist, it may well seem as if labour were the only active factor in the production of wealth; capital and land being mere conditions of its exercise—just as noise accompanies the motion of a carriage: he is told that capital is "the result of labour"; and it is therefore obvious that capital could not have been needed for labour in the first days of human life, and that it cannot be necessary for the production of wealth. Still, further, the classification is redundant: capital often takes the form of land, and one cannot separate the two factors in considering the production of a load of hay. Labourers in all cases supply a portion of the capital—their clothes, themselves; and some economists use this term to describe their acquired skill. It is almost harder to carry out the distinctions clearly when we come to objects which are used partly for pleasure and partly for gain—say a horse with which a farmer hunts and which he also uses on business errands. Here it is obvious that the "distinction between capital and non-capital depends solely on the intentions of the owner" (Mill). 'Capital' is only a symbol of human power, it is the physical embodiment of Patience: 'Land' is a symbol for the Appropriation of natural gifts that is implied in all production, and which in its more definite shape stimulates rapid production. Both of these are imperfect symbols, the use of which generates confusion; we might perhaps talk of 'Labour' without misconception, though after all it is of mental Energy and of moral Energy that we must think when we use the term, rather than of mere muscular power. Attention to these forces of human nature will assist us in other parts of the subject.

The importance of Energy and Patience for the production of wealth are obvious, but there are still some who think the Appropriation of natural gifts mere robbery. It does not lie within our province to justify it on general grounds; nor need we content ourselves with the assertion that private property is a fact, and must be taken as such; rather we may say it is a fact which has justified itself, for it is a prerequisite without which exchange can scarcely exist at all. The benefits that have accrued from trade would have been impossible unless for the prior admission of the principle—that the possessor of goods may use his own judgment about what he does with them. In the communal stage, exchange must be almost wholly unknown, and as a matter of fact the traveller in India has often considerable difficulty in obtaining the simplest and most abundant articles in a village where this phase still lingers, and where appropriation is not yet developed. There is no need to repeat the common demonstration that neither party loses by an exchange, and that generally speaking both parties gain, in order to prove the benefits which it can confer in satisfying human wants. Only let us beware of overlooking the recognition of the rights to appropriate and to *dispose of one's possessions as one sees fit*, on which the whole system depends.

The latter gives us a clue to the whole subject of exchange. In the simplest case of barter, the man who is content to wait and who is least anxious for the exchange, is at an enormous advantage in obtaining favourable terms; and the important thing to notice in every instance of exchange is the judgment of the less eager possessor as to the time to sell and the rate at which to sell: this really determines that the exchange shall take place at all. We have heard enough of the "mechanism of exchange," and the equation of supply and demand; it is perfectly obvious that the quantity supplied at a given rate equals the quantity demanded at that rate at each moment of buying and selling; but after all, this is a mere description of the fact, not an explanation. If any body understands the matter better for having it thus described, by all means let us formulate it thus, and draw our diagrams to express it more obviously. It is still true that the explanation lies deeper; there is an equation at each moment of exchange, but what equates it? The possessor of the article chiefly-sought-for supplies it in such a quantity and at such a rate as he deems likely to satisfy the demand, or it may be to create a demand. He judges of the sources from which the article may be drawn, of the probable desire of the buyer or the public to possess it, and having considered these things to the best of his ability, he offers the article at a given rate: if he has made a mistake either as to the sources of supply or the wishes of the buyers, he is forced to alter his terms.

In ignoring this power of judgment it seems to me that current Political Economy has once more landed itself in a difficulty, through striving at too great precision. In the actual trade of the world, there cannot be this definite weighing of supply and demand; the equation holds for a moment, and in the next transaction there is a slightly modified equation; there is movement, change throughout the whole market, and business-capacity lies in estimating these changes, in catching the first signs of them or reading any indication of a possible alteration in the sources of supply or in the probable demand. If this is the main element in the actual fact of exchange, it must also be the central idea in our science if it is to explain, not merely to describe; and the best explanation will be found, not in analysing the conduct of competing units, but in trying to classify the motives at work in the mind of the man of greatest business-capacity or of best judgment. Without pretending to any completeness we may arrange the principal motives in such form as this—

- I. Circumstances which affect the judgment of the seller.
  - 1. Sources of supply.
    - *a.* A monopoly.
    - *b.* A partial monopoly.
    - *c.* Open competition.
  - 2. Conditions of supply.
    - *a.* No increase possible.
    - *b.* Increase at increased cost.
    - *c.* Increase at diminished cost.
  - 3. Probable demand with *a.* increased / *b.* diminished price.
- II. Circumstances resulting from the misjudgment of another seller.
  - 1. To consumer.
  - 2. To other possessors.
  - 3. To himself.

The tabulation of the main points to be considered now-a-days has led us to use terminology which seems hardly suitable for exchange in all times and places. At the same time, if we think of the seller as the possessor of the article that is more desired, we may say that the same elements are implied in the simplest case of barter. The recognition of the right to private property coupled with the right of judgment about one's possessions, involved as they are in the very possibilities of exchange, are the clue with which we must work in simple and in complicated cases too. The clear connexion of the two rights may be most clearly seen when we remember that after all it is just where the judgment of the possessor has not free scope in determining exchange that the right to private possession seems imperfect.

This brief account of the factors at work in the satisfying of human wants would not be complete without some consideration of those developments of human resources which are only found in civilised communities, and by which the power of energy and capacity for patience may be indefinitely increased.

Skill. That Skill increases human powers of production surely requires no remark. Skill in organising labour, and applying it with due division and wise combination for the accomplishment of ends, has had results which are familiar to all readers of the *Wealth of Nations.* Of the value of personal intelligence and of the cultivation of a knowledge of scientific principles, our generation are fully convinced, as the arguments of the favourers and opponents of compulsory education alike testify. We are told on all hands that if England is to retain her place in the first rank of mechanical industry, her workmen must possess more education and thus be provided with greater Skill. And in so doing they do wisely; in these days it is not mere bone and muscle which we want; with mighty physical forces adapted to every day task we rely less than formerly on brute force; we merely want the adjustment of natural forces to materials furnished by nature, and it is by the development of Skill, not by the multiplication of labourers, that the national Energy is increased. Those who talk as East Anglian labourers and Chelsea prophets have done about the worth of a human being, forget how much more worthy the skilful man is: they forget too that a rapid increase of population in a country where a Poor Law exists has a tendency to lower the standard of Skill and the national Energy: parents cannot afford the due training of their numerous progeny, and the nation if repleted with muscle is not replenished with Skill.

Trust. The increase of the power of waiting by means of Trust is another feature of modern industry; great are the opportunities for borrowing other people's capital, and using their powers of Patience for our own ends, on the faith that they will share in our expected wealth. These facilities render it possible for any manufacturer to extend his operations suddenly, and to take immediate advantage of any new opportunities of gain that may turn up. In this way the Patience of the country can be easily directed into new channels or transferred from one employment to another. Just as by Skill, Energy is economised through being wisely applied and wisely organised, so by Trust the Patience of the country is economised, and men wait for results in those departments of industry where the best returns are to be had for the privation undergone. Its function in facilitating the exchange of goods—the way in which this new factor affects the judgment of the seller,—would require a long discussion to elucidate fully; countless questions about credit and crises are connected with it, and must be passed over now.

Such are the principal human powers which are at work in satisfying human wants; they have been exhibited in a consistent shape in their mutual relations, and hints have been dropped as to the place which each leading doctrine might hold when treated from this point of view. I would claim that nothing of economical importance need be omitted in working out the subject thus, and that no assumption has been made which is inconsistent with any condition of human development, high or low. By avoiding the temptation to unreal precision we may attain to a doctrine which, unlike the current abstractions, is widely true, while at the same time it harmonises with our ordinary talk. This last is no small advantage, and it was in the attempt to discuss economical questions with practical men that I was first led to see the convenience of treating Political Economy as a Moral Science. We may now test our representation by the means it affords for treating special questions with a fresh light; in so doing we shall encounter the difficult problems of the distribution of wealth.

III.—*Treatment of Special Questions.*

Trades' Unions. There are very many points of interest connected with these associations which we might discuss; but we shall limit ourselves to the question how far they can "better the condition of the working classes". There are probably some who use this phrase, to whom it does not seem a truism—who would feel it almost a quibble—to say that we cannot better their condition unless we first better them. The common belief is precisely the reverse, that we must have better houses, shorter hours, &c., and that then we shall have more opportunity for self-improvement, that better conditions are the first step to better men. It may be so, but unless the self-improvement comes quickly the improved condition cannot be retained; it is only by self-betterment that the better condition can be secured permanently.

For after all there cannot be a greater share of goods for each, unless there is a larger stock to be divided: it is, as we have seen, by the increase of Skill that human labour is for the most part improved in its powers; and, other things being equal, there is no better source to which we can look for the satisfaction of human wants than increased Skill; it is by this means that a greater permanent supply can be obtained, and a larger share given to each. It may indeed be said that there is another way of enlarging the gains of the labourers—not by increasing the wealth of the world, but by altering the proportions in which it is divided, and that by aiming at this we may better the condition of the labourer without waiting for the more tedious process of bettering himself. Yet after all the bargain between the capitalist and the labourer—however we interpret it—is a case of exchange, and must come under the general delineation of exchange which we have given above. The better man, either he who has most Skill, or he who has most independence and ability to wait, will be in the best position for making terms with his employer. In so far as Unions have succeeded in raising wages, it may be said that they have done so because their members have been made self-reliant men: in so far as they can retain these advantages, it must be because their members are more skilful than they were,—because having what is more valuable to dispose of, they can afford to drive better terms in the bargain. The strength of a Union depends on the Skill of those united as well as on the strength of the bond between them: mere union may overcome divided employers, but only skilled union can hold its own against federated ones. Mere reliance on each other must be in the long run as futile as isolation has proved, unless there is Skill in each other on which they can rely: this and this only can serve as a vantage ground from which to dictate better terms. How far this is recognised by working-class leaders does not concern us at present, though there have been signs recently that some of them are more keenly alive to it than is generally supposed.

Capital. A whole network of confusion runs through the recent discussions on capital. There are those who speak of all capitalists as usurers that "exploit" the labour of their fellow-men while performing no service themselves: but those who regard the right of a man to keep what he has worked for as "the corner stone of all economy"* should not deny the right of a man to keep what he has waited for. Take the first dozen men who pass Temple Bar and offer them their choice of a sovereign to-day or a guinea this day six months, and if any man undertook the risk and privation of waiting he would have fairly earned his reward. The new materialistic Economy tells us that the capitalist merely supplies money, that it is labour which imparts value to the objects, not dead money, which has only a conventional not intrinsic worth. To which we may reply, it is Patience which the capitalist exercises; what he supplies is the ability to wait for the results of labour: for this capacity of waiting he claims his gains, and it is according to the anxiety involved that he is rewarded. If any movement render this reward doubtful the capitalist must have a greater inducement to make him wait in troublous times: a crusade against the "tyranny of capital" would frighten capitalists for a time at least, and compel them to seek better terms from the self-destroyed labourer: this would be no mere attempt at a better division of goods, but an attack on one of the fundamental requisites of production—the capacity for waiting.

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* Mr Ruskin.

Other writers see a danger, not in the greatness, but in the smallness of the capitalist's reward. They affirm that the rate of profits is diminishing, and assert that the time is at hand when no one will longer undertake the risk of waiting for such a small reward. The former part of this statement is undoubtedly true: so far as labour is expended on the soil, the rate of return for increased exertion is not proportionately greater: even in the manufacturing districts there is a reflection of the rural difficulties, in the greater price of coal and material, and only a diminished surplus can be appropriated as the reward of waiting. But there is an error in looking solely to the rate of profit obtainable, and not to other sides of the question as well. The truth seems to be that the capacity for waiting increases, in spite of the diminished reward; and in some cases of a diminished rate of profit, *e.g.*, when it is due to increased security, the capacity for waiting is not affected by it at all. However low the rate of profit may be, we are not near the "stationary state," so long as men are willing to save from their increase and add to their capital.

Again we are told that capital is being driven from the country by the action of Unions. They certainly may affect the rate of reward in one department of industry so seriously that capital will be withdrawn, but it need not necessarily lie idle. It will—so far as it can be realised—seek other employments, and so long as the capacity for saving survives, we need have no fear of inability to set labour in motion. The change in the rate of reward could not be a general one—certainly not a permanent one, unless there was a growth in the Skill of the proletariate, and consequently in their power of driving a bargain. With that change there would also have come an increased stock of wealth to be divided; nor, as long as we see that the capacity for waiting has survived the pressure of the diminishing return from land, need we fear that it would be destroyed by a re-adjustment of the rewards of Patience and Energy.

Population. The Currency offers a tempting field for discussion at present, but we must draw these remarks to a close with a brief allusion to another burning question. The law of population grievously needs to be restated in the form in which it was first uttered by Malthus. He spoke of the evil of population increasing more rapidly than the means of subsistence. To-day we hear men talk of the increase of the human kind as if it were a positive evil; men enunciate doubtful physiological statements and more than doubtful moral doctrines as to the means of preventing this curse. In all this we have a narrow view of man, as a slave of his appetites and physical conditions. Is this so? Is it not rather true that there are boundless resources in human nature for the increase of Skill and Trust, the development and economising of Energy and Patience, and thus for the continued satisfying of human wants? The capacities of human nature may be developed so as to supply infinitely multiplied needs. It is not an increase of population that is an evil, but a disproportionate increase, and the cure for this evil lies, not in bowing to the limits at present set by climate and soil, but in developing those human powers—including that of self-control—by which men have hitherto succeeded in overcoming nature. If want increases more rapidly than resources do, misery must ensue; but the ratio may be altered in either of two ways, and the permanent remedy lies in developing the resources more rapidly, rather than in trying to suppress the wants.

W. CUNNINGHAM.

VIII.—CRITICAL NOTICES.

Traité de la Nature Humaine (Livre premier, ou 'De l'Entendement'), traduit pour la première fois, par MM. CH. RENOUVIER et F. PILLON, et *Essais Philosophiques sur l'Entendement* (traduction de Mérian corrigée). Avec une Introduction par M. F. PILLON. Paris: Au Bureau de la *Critique Philosophique*, 1878. Pp. lxxii., 581.

Hume-Studien. I. Zur Geschichte und Kritik des modernen Nominalismus. Von Dr. ALEXIUS MEINONG. Wien: Gerold's Sohn, 1877. Pp. 78.

THE revival of interest in Hume's philosophy is one of the most marked features in the thought of the present day. At home, though he never was put outside the philosophic pale (as foreign critics are rather prone to suppose), it is true that, since the generation of the Reids and Beatties and Campbells whom he so greatly exercised, he has seldom been either consciously followed or expressly opposed; and the more remarkable therefore is that new interest, variously begotten, which has resulted already in the edition of his philosophical works so elaborately prefaced by Prof. Green. Nor is the interest less signal abroad, as shown by the two works here thrown together, though they are only the latest among many similar evidences.

M. Pillon, in his striking Introduction, tells us plainly why he and his master, M. Renouvier, have joined to produce this first French translation of the work of Hume's youth. M. Renouvier's doctrine is not such a mere outgrowth from the Critical Philosophy as to be in relation with Hume's thought only through Kant. While holding fast by the "Apriorism" and all the ethical implications of the Kantian doctrine, M. Renouvier's philosophy is a system of pure phenomenism, and rejects the notion of Substance which Kant brought back in the guise of the noümenal thing-in-itself after it had been expelled by Hume. From Locke through Berkeley to Hume as well as Kant, and from Hume and Kant to M. Renouvier, in whom the differences of these two become reconciled,—lies, we are told, the progress of the critical idea in modern philosophy. This may be a somewhat exclusive reading of the post-Kantian movement, ignoring the not less remarkable phenomenism (upon a Kantian basis) of Mr Shadworth Hodgson, to say nothing of the similar doctrine struck out already in Kant's day by that acutest of his critics, the Jew Salomon Maimon, whose anticipation of his own thinking Mr Hodgson so generously acknowledges in his new work, *The Philosophy of Reflection*. But the succession has the merit of placing Hume in a light not more striking than true, and it adequately explains the anxiety of M. Renouvier and his able and indefatigable associate, M. Pillon, to make Hume known in France by that earlier and greater *Treatise of Human Nature*, which alone contains his critical doctrine of Substance. The relation between the *Treatise* and the later *Inquiry* (which very soon passed into French as into other languages, to the gratification of Hume's whim that by it alone he should be judged) is on the whole very accurately conceived by M. Pillon; and, if he contends for the philosophical superiority of the earlier work, while asserting their general identity of spirit, he is careful to note also the occasional points where (as on the subject of psychological causality) the shorter *Inquiry* is more explicit. He omits, however, in this connexion all reference to the passages that serve to determine the extent of Kant's acquaintance with Hume, though nothing so nearly concerns his own view of Hume's importance in the general critical movement. If, as the internal, even more than the external, evidence seems to make sure, Kant knew nothing of the *Human Nature*, it was open to M. Pillon to urge that Kant lagged behind in respect of the doctrine of Substance, because he was ignorant of Hume's advance.*

M. Pillon's criticism on Hume's philosophical doctrines is in general not less forcible than his exposition of these is admirably concise; but the justice of his view that "Sensationism" reached its final expression in Hume and stood self-convicted of insufficiency, depends on what meaning is given to that word. Hume did unquestionably carry to a legitimate conclusion Locke's statement of the sources of human knowledge, and, either failing to account for the plain facts of our intellectual consciousness or accounting for them only by a surreptitious assumption of other principles, may truly be said to have demonstrated the insufficiency of Experientialism as it was then understood. But it is not therefore clear that the alternative to "Sensationism" lay in such a system of "Apriorism" as Kant set in its place, and his followers, critical or criticist, would in different forms still maintain. The Experientialism now once more in the ascendant is neither that of Locke and Hume, nor, however allied in spirit, related to it in the way of affiliation. Appearing as the natural reflex of general scientific progress in the interval, it conceives the whole question of Knowledge in a larger way. It does not dream of tracing the growth of consciousness in the individual, psychologically, from the occurrence of a hap-hazard series of impressions passively received, or, philosophically, of making the individual's subjective experience the test of scientific truth. When M. Pillon contends against Hume for "categories, concepts, forms and laws of mind" or what not, in supplement to discrete sense-impressions, he puts only in one way what experientialists at the present day put in another when, besides crediting the individual with a personal activity, and besides allowing for inherited predispositions, they farther suppose a non-personal element of knowledge in the slowly developed social tradition of language, &c., moulding into common forms the product of each individual's reaction upon his incidental experience. And if it should be said that this amounts to an abandonment of the position to the adversary, the reply is that the rationalist has had gradually to abandon more and more of *his* pretensions from the time when experience was counted as nought towards the result of knowledge, till now he is left only with an assumption of barren forms which, though truly not explicable from individual experience, are there chiefly as a datum to be accounted for by reference to the slow deposit of experience in generation after generation. But, however it be with this question of principle, M. Pillon, it must be granted, follows his master M. Renouvier in giving something more than merely formal answers to the questions that occupy the modern psychological school, and there are several passages in this Introduction well deserving of close attention as examples of a remarkable, and as yet too little known, phase of contemporary thinking.

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* The internal evidence consists chiefly of the two points: (1) that Kant charges Hume with discussing the question of the validity of human knowledge not in its full generality, but upon the single issue of causation—which is true of the *Inquiry*; (2) that he declares Hume to have recognised only a logical necessity in mathematical cognition—which is again true of the *Inquiry*, but the *Inquiry* only. M. Pillon sets out the very different view of mathematical judgments to be found in the *Human Nature*, without remarking the curious change—being a reversion to Locke's position—that had taken place in Hume's mind as to this part of his doctrine before the *Inquiry* appeared. The *Human Nature* was not translated into German till 1790-1; the *Inquiry* was accessible to Kant in Sulzer's translation from 1755. (This last date is wrongly given as 1775 in the English translation of Ueberweg's *Geschichte.*)

Mr Sh. Hodgson, in the preface to his new work, p. 14, has some admirably pointed sentences on Hume, but appears to overlook the evidences just quoted when he says:—"The Hume that belongs to the history of philosophy, the Hume that roused Kant from his 'dogmatic slumber,' will always be best known to us from the *Treatise of Human Nature.*"

Hume's doctrine of Abstract Ideas (on which M. Pillon has some acute remarks) is selected by Dr. Meinong as the central subject of the first in a series of *Hume-Studies*, which he has begun to contribute to the *Proceedings of the Vienna Academy*. The doctrine, while set out in a very characteristic and important chapter of the *Human Nature*, is one of those that have no place in the *Inquiry*, and Dr. Meinong's view is that the question of the true relation of the two works can be brought to a settlement only by such an exhaustive scrutiny of their differential parts as he here begins. His tractate (published separately as above) has, however, also the more general character of a contribution to the history and criticism of Modern Nominalism. Thus, he enters somewhat minutely into Berkeley's theory of Abstract Ideas, with which Hume so expressly connects his own, and this of course carries him farther back to Locke, whom Berkeley expressly opposed. Then, although it seems to be his opinion that Hume omitted his earlier doctrine from the *Inquiry* because of its manifest imperfections, Dr. Meinong believes that he finds distinct traces of its influence on the views of later English psychologists. And he also includes, within his brief but closely-argued essay, an independent discussion of the question at issue.

In his critical exposition of the historically connected views of Locke, Berkeley and Hume, Dr. Meinong offers some fresh observations; as when he very neatly remarks on Locke's paradoxical statement as to the difficulty of forming the general idea of a triangle (which "must be neither oblique nor rectangle, neither equilateral, equicrural, nor scalenon, but all and none of these at once"), that it is based on a confusion of the extent with the content of a notion. It was against this and other statements of Locke's that Berkeley directed his famous protest so often cited as an enunciation of thoroughgoing Nominalism; but Dr. Meinong points out that in reality Berkeley lays no positive stress upon the function of language in generalisation, neither asserting that names alone are general (the true note of Nominalism according to Dr. Meinong) nor even maintaining that names are an indispensable help to conceiving, though it is true that on the one point of the use of language in symbolic thinking he goes to exceptional lengths. Hume, therefore, who does take his stand upon the generalising agency of language, was in error when he supposed that he was simply passing on and confirming the doctrine of Berkeley; and to him, rather than to Berkeley, says Dr. Meinong, should be assigned the name of the father of Modern Nominalism.

This last remark, in the connexion in which it is made by Dr. Meinong, is not without its justification. While Hume expressly declares that "a particular idea becomes general by being annexed to a general term, that is, to a term which from a customary conjunction has a relation to many other particular ideas and readily recalls them in imagination," Berkeley supposes generalisation to consist in the mere representation (suggestion) of a number of particular ideas on occasion of one, and takes representation by means of a name (which is itself a particular idea) to be only one case in which the principle applies, though it is that one which, according to him, has misled Locke and others into thinking that the mind has hold of properly abstract ideas in correspondence with the names. Dr. Meinong, however, is surely somewhat at fault, when upon that single ground he enthrones Hume in place of Berkeley and would have it that all later nominalists are what they are because of Hume's example. To say nothing, in the first instance, of an influence from Hobbes (who, before Locke, might be expected to figure in a historical view of Modern Nominalism), what real evidence is there that the thinkers who have come after Hume have been specially affected by his nominalistic utterances? Dr. Meinong refers but to four—the two Mills, Prof. Bain and M. Taine (whom, though a Frenchman, he very properly classes with the English succession). Now among these he finds the younger Mill to be in strictness more conceptualist than nominalist, but in any case to have held a view of abstraction and generalisation very different from Hume's. James Mill and, in one place, Prof. Bain, are found expressing opinions that have some affinity with parts of Hume's doctrine, but there is not the least proof of direct obligation in either case. Finally, of M. Taine, Dr. Meinong can only say (with questionable correctness) that his Nominalism goes farther than Hume's, and is of a type that hardly any thinker of mark would now care to approve. There is in reality, so far as regards the Mills, much more evidence, both external and internal, of influence from Hobbes than from Hume, and the truth about the English thinkers generally is rather this, that from the days of Hobbes (to go no further back) they have all been nominalistic in spirit. Locke, despite his occasional lapses into ultra-conceptualism, is in the main almost ultra-nominalist, and this most probably in unacknowledged dependence on his predecessor. Berkeley, though most concerned to establish against Locke the individualised definiteness of mental representations, shows himself anything but oblivious of the haunting presence of language with every act of general intellection. Only if Nominalism is defined —with apparent sharpness but really without point—as meaning that nothing is general but names, can it be a question whether Berkeley and Locke are nominalists, and when it is so defined it may well be doubted whether Hume is in truth more nominalist than they. Nominalism would seem to be strictly enough understood when taken as the view according to which the mind is declared impotent to know generally, or to *conceive*, without the help of some system of definite particular marks and signs.

The outcome of Dr. Meinong's very careful inquiry as regards Hume in particular, is that he fails by not taking account of the intension of concepts and by seeking to explain their extension from association of ideas. Hume is supposed by Dr. Meinong to be the first who made Association a general principle of psychological science,* and to have been misled into applying it without due discrimination. The principle, it is urged, cannot account for that aspect of the notion which is called its extension, because this, unlike the intension, has no ideal fixity but is liable to vary indefinitely with real experience (p. 30). Perhaps I fail to apprehend Dr. Meinong's true meaning here; but if not, the observation does not seem very much in place. The fact that the extension is really indefinite is not inconsistent with the supposition that the concept became formed in the mind by a more or less definite association of particular resemblances or resembling objects. Nor, on the other hand, is the intension either so ideally fixed as to be practically unchangeable, or itself not amenable to Association (in this case 'contiguous'), whenever it involves a synthesis of a number of attributes found to be conjoined in experience. Hume's doctrine is imperfect in many ways as an account of the psychological formation of the concept, but its fault does not lie in the part assigned to Association (whether by similarity or contiguity). It fails chiefly by not carrying out that reference, begun by Berkeley, to the function of Attention, which is the positive factor in the act of Abstraction.

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* M. Pillon, in a short paper entitled 'Quel est le veritable père de la psychologie associationiste'? *(La Critique Philosophique*, 27th Dec., 1877), makes a like claim for Hume, and blames Mill and others for ascribing so much importance to Hartley. Now it is true that Hume published his *Human Nature* eleven years before Hartley's *Observations on Man*, and Mill is clearly wrong in point of fact, when he says that Hartley "was the man of genius who first clearly discerned that the great fundamental law of the Association of Ideas is the key to the explanation of the more complex mental phenomena" (Pref. to his father's *Analysis*, 1869). But, on the other hand, there is every reason to suppose that Hartley, who so scrupulously makes his acknowledgments to Gay, borrowed nothing whatever from Hume; and Mill's very statement proves how much more potent Hartley's influence has been than Hume's upon the later associationists like himself. Everything, in fact, goes to show that Mill got his impulse through his father from Hartley and Hobbes, rather from Hume; while as for Associationism, its true origins are to be sought farther back than in Hume. Berkeley is implicitly a thoroughgoing associationist, and Locke himself, when he speaks (with still earlier sensationalists) of 'compounding,' has partial hold of the general principle of mental synthesis called later on, by Hume and others, Association of Ideas. (This last phrase, it has often been remarked, heads a chapter in Locke's Essay, but only with a quite special reference to the explanation of mental idiosyncracies in different people.)

One word, before closing, on Dr. Meinong's valuable discussion of the material question. His solution of the various disputes as to the relation in knowledge between the General and Particular on the one hand and the Abstract and Concrete on the other is, in my judgment, essentially correct. There is no generalisation without abstraction, but abstraction is possible without generalisation. Abstracts may well be singular, and, whether singular or general, they are not confined to mere attributes of concrete objects. Generals are always abstract. Concretes are always individual or singular, but the knowledge of them includes only in each case such conjunction of attributes as directly impresses the senses. Individuals are mostly known in a form more or less abstract. These are a few of Dr. Meinong's positions, and the others to be found in his pages, though they do not exhaust the subject, make up a very important contribution to its scientific determination. In particular may be noted his criticism of the common dictum that extension and intension vary inversely —a dictum which, if it implies that all generals are abstract, no less implies that all abstracts are general. Dr. Meinong offers a better statement of the conditions under which the dictum is applicable than is to be found, I think, in any of the books. His *Hume-Studies*, if they may be judged by the first of them, promise to be deserving of all attention.

EDITOR.

Die Forschung nach der Materie. Von JOHANNES HUBER. München: Ackermann, 1877. Pp. 109.

HERR HUBER's essay, which though small in compass is a most weighty contribution to the question of sense-perception, opens with a rapid sketch of theories of matter. The modern semi-physiological view of perception which limits our knowledge of matter to the states of sense-consciousness produced by vibrations from the external world, is stated with particular care, as in it the author finds the special deficiency which it is the object of his work to supply. It is clear, he points out, that if we are absolutely confined to the changes of sense-consciousness, we can through them attain no knowledge of what lies beyond and gives rise to them. Either then by thought we obtain a knowledge of things, in which case the independent existence of thought must needs be granted, or the doctrine which professes to explain the content of consciousness from mechanical movements must be acknowledged to be entirely without scientific basis. It is well, we think, to lay stress upon this dilemma, for we are too much accustomed to find consciousness explained with the one hand as the result of external action, while with a dexterous turn of the other hand external facts are transformed into conscious states.

Accepting, then, as his stand-point, the existence of Thought distinct from the states of sense-consciousness, Huber proceeds to analyse more carefully what is really involved in Perception, or cognition of external fact. The two forms of perception, Space and Time, he examines historically and critically, with the conclusion that both are phenomenal or subjective but rest upon or correspond to certain real relations. Thus Space is the mode in which the co-existing manifold of sensation is grouped or reduced to the unity of consciousness. It therefore depends upon a real multiplicity or plurality of real objects, which determine the manifold of sensation, and involves the unity of self-consciousness. Similarly Time is the mode in which are grouped successive changes in states of consciousness; without the representation of continuity in the series of mental states, we could have no knowledge whatsoever of any one of them. As with space, it rests upon an objective fact—change or motion in real things, and involves the unity of the thinking subject.

The existence in us of these two phenomenal modes of representing the real proves the existence of a multiplicity of things external to us. How are such things to be thought? As Forces, or Causes: for the only function we have yet ascribed to them is that of giving rise to or causing sensations. In themselves spaceless and timeless, the atoms in reciprocal action give rise to those primary mechanical relations which are the fundamental notions of physical science. But it is apparent that the mechanical view which explains all phenomena by reference to change of position in space can by itself yield no ultimate explanation of its own principles. We are driven to regard mechanical causality as secondary in nature—as a consequence of the original form or properties of the world of atoms. Further, no purely mechanical interpretation is possible of qualitative differences, or of the movements of living and thinking beings. Changes in the inner condition of the atoms are incomprehensible as alteration of space-relations, for the atom is unextended. We must, in order to reach a final explanation, ascribe to these atoms psychical characteristics; we must think them as monads. The properties which physical science ascribes to the ultimate elements of matter, such as extension, elasticity, inertia, &c., cannot belong to these elements in themselves: they are but the modes under which the reciprocal actions of the monads appear to sense. The inner side of action is a psychical process; only the outer takes on a mechanical form. Matter, then, is only a phenomenon of our sense-consciousness, and it is critical reflection upon this phenomenon that leads to the assertion of the existence of immaterial atoms or monads. The reality of these assumed causes is guaranteed by the validity of the thinking process which affirms them.

But the phenomenal reality is conditioned by the reciprocal action of the atoms, and as no mechanical explanation of this action is possible, it must be ascribed to the inner tendency of the monads themselves. Causality is immanent in them, because each forms part of a whole, is incomplete in itself, and strives after the complement of its existence. Mechanical attraction, chemical affinity, and animal desire are essentially the same—efforts towards completion, towards restoration of the higher unity of which the individual is a part, and through which it comes to full being. Behind matter then, which is only a sense-phenomenon, there lie psychical processes of which it is the external manifestation. The material and the psychical are but two sides of the same reality, differing in their mode of appearing.

To many thinkers such a view of reality seems to involve rejection of natural law. How can there be regular, constant connexion of phenomena, when these are due to psychical forces? To this Huber answers by first pointing out that regularity or conformity to law in the phenomenal world rests upon the supposition of fixity in the number, quality and relations of the primitive monads. But these monads do not furnish an explanation of their own being; we are driven to postulate a unity of principle out of which they have sprung, and this fundamental unity must be in its nature psychical. The primitive soul *(Urseele)* cannot be conceived as immanent in the monads, nor can the monads be regarded as originating by the self-diremption of the primitive monad. The production of the monads must then be ascribed to a creative act, by which the uncreated monad gives rise to the many and still retains its own unique being. But such a productive act can only be the work of thought, of soul as thinking, νοῦς. The ultimate principle, then, to which our logical thinking conducts us, is the absolute spirit, self-determining and all-creative. "Our reason, to which in the course of its researches the universe first appeared as a huge mechanism of inanimate atoms, then as the reciprocal action of intimately connected elements, then as the organic complex of animated *(beseelter)* members or monads, finds ultimately, as the principle of mechanism, chemism and psychical organism, Thought, which as original is not, like human thinking, limited to reflection upon what is already given, but must be regarded as absolutely self-determining and productive" (p. 109).

It will be seen that Herr Huber's essay is one of the most vigorous statements of a view already familiar to philosophy, and now finding its way into the realm of natural science. We should have been glad to have had from the author a more particular examination of the part played by thought in reflecting upon the phenomena of sense-consciousness. Despite all that has been written upon the principle of causality, we cannot think that the difficulties connected with it have been so cleared up as to permit us without further question to apply the principle to determine the existence of objects confessedly not given either in time or space. The reasoning by which space is shown to involve multiplicity of reals seems also to want further explanation. That the intuition of space involves intuition of a manifold is evident; that this manifold is itself not in space, and that the space-manifold must be due to a real multiplicity not in space, are propositions by no means self-evident. Temporal simultaneity of sensations is not, we must consider, sufficient ground for representation of these as in space.

There remains, too, the difficulty which is peculiar to all monistic schemes. They do not render any explanation of the acknowledged difference in kind between material and psychical. It is hardly sufficient to say that these are but diverse modes of appearance of the same unity, for the diversity of appearance is exactly the diversity in need of explanation.

Minor difficulties remain in plenty: *e.g.*, the principle that as each monad is part of a whole it is incomplete and strives after full being, cannot be at once accepted; but without dwelling on these, we may conclude by recommending the essay to the attention of all who are interested in the present remarkable *rapprochement* between physics and metaphysics.

ROBERT ADAMSON.

IX.—REPORTS.

AN INFANT'S PROGRESS IN LANGUAGE.

THE following notes were made in humble following of Mr. Darwin's and M. Taine's example, at first for my own amusement and without any distinct purpose of letting them go further. I found, however, that they grew under my hands, and that the Editor of MIND thought further contributions on the subject of children's mental growth would be desirable. Here I have kept in the main to the one point of language, and though I have probably omitted much, I think I have set down nothing as fact which has not been actually and distinctly observed. Exact dates I have not attempted to give, conceiving that they would be of no use unless for the comparison of a very large number of observations. Children differ so much in forwardness that the time of particular acquisitions seems of little importance as compared with their order. Though I have no pretensions to skill in phonetics, I thought it at least desirable to use some consistent notation for the sounds actually produced. For this purpose I have taken the Indian Government system, with a few additional signs which will speak for themselves. I may explain that in this notation, while *á*, *í*, are the long Continental *a* and *i*, unaccented *a* is not the short

Continental *a*, but the obscure or neutral vowel (*Urvocal*) heard in English "at," "that," "but," when not emphatic; when strongly given, it becomes the full sound of *u* in emphasised "but". Thus the Punjaub, Lucknow, Kurrachee, of popular use become in the official spelling *Panjáb*, *Lakhnau*, *Karachi*. "Governor and Company" would be written *Gavarnar and Kampani*. The vowel-sound in "bank," which does not occur in Indian languages, could be expressed only by some special symbol. I use *â* for the broad sound of *a* in "fall". Words in italics are in the Indian Government spelling. Words between inverted commas are in ordinary English spelling.

Age, 12 months. *M-m* often repeated; *Bá bá* repeated an indefinite number of times.

M-m generally indicated a want of something. *Bá bá* was (1) a sort of general demonstrative, standing for the child herself, other people, or the cat (I do not think she applied it to inanimate objects); (2) an interjection expressing satisfaction. Both sounds, however, seemed often to be made without distinct intention, as mere exercise of the vocal organs.

13 m. *Dá dá; Wa wa* (water, drink); *Wah wah*, with a guttural sound distinct from the foregoing (dog, cat); *Ná ná* (nurse—of course as proper, not generic name).

Dá dá was at first a vague demonstrative. I noted, however, with a query, man as a second and specialised meaning. About six weeks later it became a distinct proper name for the child's father, and has been consistently so used ever since. By this time the significance of pictures was in a general way understood. The child said *wah wah* to figures of animals, and attempted to smell at trees in the illustrations of the *Graphic*. (Six months later she pretends to feed the dogs in a picture.) The fact is curious, having regard to the inability of adult savages, as reported by many travellers, to make anything of even the simplest representations of objects. About this time the ticking of a watch gave great pleasure, and for some months afterwards the child constantly begged to have one put to her ear, or still better, to have it in her hand and put it there for herself. Five or six months later she had left off asking for it.

15 m. *M-m* discontinued. Sometimes *bá bá* used instead; sometimes she simply cried for a desired object.

Imitative sounds to represent dog, cat, sheep, ticking of clock. *Wah wah*, *miau*, soon became generic names of dog and cat (*wah wah*, which at first included cat, becoming appropriated to dog). I think, however, *wah wah* would include any middling-sized quadruped other than a cat or a sheep. As to cat, her name for it became a few months later *aya-m* or *ayá-m*, which so far as I know she invented for herself. The conventional "gee gee" for horse was very soon understood by her, though she could not form the *j* sound. She recognised a zebra in a picture alphabet as "gee gee," and showed marked dissent when told it was a zebra.

These imitative sounds were all learnt on the suggestion of adults, but studied from the real sounds; for as made by the child they are decidedly nearer to the real sounds than the *baa baa*, &c., used by adult voices.

"Baby" (or rather *bé bi*). This word was now formed with fair success, but soon dropped for a time. About a month afterwards it was resumed, and became the child's name for herself. This was long before she attempted any other dissyllable. It was pronounced, however, rather as a reduplicated monosyllable.

16 m. *Bâ* (ball), sometimes *ba*. *Tá* (1, thanks; 2, take, when offering something): this was deliberately taught her.

Playing with a ball became a favourite amusement at this time. She would throw a ball out of window and expect it to be returned. When we tried a regular game of ball she seemed to think the point of the game was to get possession of the ball and keep it. A certain capacity for dramatic play was now first observed. The child knew the various animals in a toy menagerie by name, and would make believe to feed them with a spoon. About a month later she was taught a piece of rudimentary drama. The picture of the "little boy that cries in the lane" and gets no wool had fixed her attention in a book of nursery rhymes, by this time constantly in hand, and now, on being asked, What does the little boy that cries in the lane do? she puts up her hands to her eyes and whimpers. She laughs afterwards, which I think is fair evidence that she understands the performance and considers it a good joke.

17 m. *Ní* (knee). This is a real word used in a special, and at the same time extended, meaning. It signifies: *Take me on your knee and show me pictures;* and also expresses in a general way the idea of something (generally the cat) being on a person's lap, so that *ní* not unfrequently means: *I want to see the cat on your lap.* She also puts a toy dog on her knee and repeats *ní* several times with great satisfaction. About this time "baby" came to be freely used as an imperative or desiderative, combined with movements or gestures indicating an object—the sense being, *I* want that.

17-18 m. *Má má*, mother. I have no note of when this word began to be used (probably it was some months before this), but it was well established by this time at latest.

Ná ni or *ñá ni* (granny).

Pí (please). On learning to say "please" in this fashion the child left off putting her hands together to ask for things, which she had been taught to do before she could speak.

Pé pé, pencil (only once heard).

Pá pá. This was taught her as a synonym for *dá dá*, but she would not use it. Both "paper" and "pepper" (as common objects at the breakfast table) became in her mouth something not easily distinguished from *pá pá.* This may perhaps account for her unwillingness to take up the new name.

Ba or *bö*, book.

"More," or rather *mâ*, often prolonged to *mâ-a* or *mo-a*—to ask for more of some food, &c., or to ask for any action that pleased her to be repeated. This word enabled her to form an approach to a sentence: thus *mâ . . . má má* ("more, mama").

Tá tá (taught her as the usual baby word for good-bye, but extended by herself); always distinguished from the single *tá* noted above. *Tá tá* not only is used to say good-bye, but expresses the general idea of going out of doors. Thus she says *tá tá* to her perambulator, and on seeing one take up a hat or overcoat.

A final nasal sound is now produced: she tries to say "down," what she does say being roughly *dáõ*—take me down from my chair—a very frequent request, as she can by this time walk easily, and is fond of running about the room.

The vocabulary is now increasing fast, and almost any word proposed to the child is imitated with some real effort at correctness. The range of articulate sounds is still very limited: *a*, *á*, *i* (short and long) are the only vowels fully under command; *â* occurs in a few words, and is the usual result of attempts to form *o*: thus, *nâ*—nose. The long sound of English *i* (*ai*) cannot be pronounced; when she tries to imitate it she says *iá* or *í-a*. No approach is yet made to the peculiar English short sound of *a* in such words as hat, bat. Of consonants *g*, *l*, *r* (the true consonant initial sound; the final semi-vowel, as in more, poor, is easy enough to her), and sibilants, aspirates, and palatals are not yet mastered. "Guy" (a younger cousin's name) is called *dá*, or perhaps rather *ḍá*, the *d* or *ḍ* produced far back and apparently with effort; *k* is also produced far back in the mouth, with an approach to *t*. Final consonants are seldom or never given, and the vocabulary is essentially monosyllabic, the only exceptions being in in the nature of proper names ("baby," *ná-ni*, *ná-ná*), and even these are reduplicated monosyllables rather than dissyllables proper. She once said "lady" pretty well, but did not take it into use. No construction is yet attempted; the first approach to a sentence above noted has not been repeated. Even with these resources the child already contrives to express a good deal, filling up the meaning of her syllables with a great variety of tone, and also with inarticulate interjections. Impatience, satisfaction, disappointment, amusement, are all very well marked; and perhaps even intellectual dissent (in the case of "zebra" and "gee-gee," see above).

After this time (*viz.*, her 18th birthday, reckoning birthdays by calendar months, as for this purpose is convenient), the child's progress became much more rapid, and it would not have been possible to take down all her new words without giving much more and more continuous attention than I had at my disposal. I also doubt if anything would have been gained by it. The subsequent notes must be taken as being rather selections than a full record.

18-19 m. "Poor" (should perhaps have been set down earlier): no appreciable difference from ordinary adult pronunciation. *Dam* (gum), a word of large significance; see next paragraph.

"Poor" was taught as an expression of pity, but extended to mean any kind of loss, damage, or imperfection in an object, real or supposed. Some of her reasons for assuming imperfection were curious. She said "poor" to the mustard-pot and spoon, taking, as we suppose, the moveable spoon for a broken part. "Gum," on the other hand, with which toys are often mended, is conceived as a universal remedy for things broken or disabled. Later (at 22½ months) she says "poor" to a crooked pin, and on my beginning to straighten it, "dada mend".

The sound of *g* is now coming, and a final nasal is developed. "Down" is pretty well pronounced. *Ding* = dinner—not the meal or meal-time, but a toy dinner service.

Bé bé = biscuit, with desiderative-imperative tone and meaning.

19 m. *O* sound now distinctly made, and *g* distinct by the end of the month. "Guy" is now *gá* instead of *dá*. A final *l* once or twice observed: *t'âl* = shawl. Final *t* distinctly made: *hat* or *höt* (hot). Soon afterwards *p* (in "top" pronounced *tap* or *töp*); *pu* = foot; after mastering final *t* she said *fat*. The monosyllabic form (one consonant and one vowel) still prevails. *K* is a favourite sound, and she has several words formed with it which are carefully kept distinct. *Ku* = stool. *Kah* (later *kad*) = cod [liver oil], which she considers a treat. *Ko* = "cosy" (on teapot); later *ka-zi* or *ka-zhi*. *Kâ* = cold. *Kú kú* = chocolate. *Khi-en* or *kli-en* = clean; her first real dissyllable, for so she pronounced it *Bè* for biscuit has now become *bek*. *Sh'ad* (thread). She has now observed the process of sewing, and tries to imitate it. Things broken, etc., are now divided into those which are to be mended with *dam* and those which are to be mended with *sh'ad*. Approach to *chu* (sugar) and *shu* (shoe, also sugar) sometimes quite distinct. I also note "jar" as well said, but *s*, *sh*, *ch*, *j*, are on the whole indistinct, and attempts to form them give curious palatal and sibilant sounds which I cannot write down. *W*, *v*, *f*, are now formed, but not well distinguished. *Vák* or *wák* = walk, *fák* = fork. Here also we get intermediate sounds. The *w* is often more German than English, though she cannot have heard the German *w* spoken.

The fork is a toy fork in the set of things generally called *ding* or *din*. But *fák* has another unexpected meaning. The child likes to look at an old illustrated edition of Dr. Watts's poems, and she has turned "Watts" also into *fák*. It is possible, as M. Taine suggests, that to her there is some shade of difference in the sounds which escapes adult ears. At 20 months 25 days she said *vats* or *váts*. "Walk" has its proper sense as a mode of motion, opposed to riding, in perambulator for herself or in carriage for others. She is much interested in watching callers going away, and says to them *dyi dyi* or *zhi zhi* (gee-gee) . . . *wák*, as if to ask how they mean to go; or perhaps merely to show her knowledge. Sometimes she begins to say *tá tá* to a visitor, not that she is tired of his or her presence, but that she wants the amusement of seeing the departure.

She has learnt to repeat *no no* after she has been told not to do something, as an act of assent to the prohibition, and she seems to take pleasure in saying *no no* to the cat.

20 m. *Dash* or *dásh* = dust. *Ta'sh* or *tá'sh*, learnt, I think, from "touch," one day repeated several times without assignable meaning, and then dropped. *Tásh*, however, is adopted for (mous)tache. N.B.—Final sibilants are more under command than initial. Final *g* now produced: *geg* = fizgig (toy so called).

At this time a sudden advance was made to dissyllables. Several words were produced with success on or about the same day: "Fanny, honey, money" (these two learnt from the rhyme of "Sing a song of sixpence"), very distinct. "Money," however, seems to be confused with "moon": when told to say moon she says money. Others are attempted with more or less success: as *fá-wá*, flower; *la-ta*, letter; *ha-pi*, happy (taught her as opposite of "poor," but I doubt if she sees the meaning. She has taken up *ha-pi* to stand for "empty," which we tried to teach her, and in that sense uses it without prompting.) *Bá-ta*, butter. The child's own name, Alice, is given as *A-si*, or perhaps *A-śi* (later *á-si*). As to sound, she is now acquiring the English long sound of *i (ai)*. *R* is still impracticable, and attempts to form it sometimes give *d* (but this was very transient, and *l* soon became the common substitute): compare the converse Bengalese treatment of Skr. *ḍ*, which I believe is in Bengal regularly pronounced as *r*. "P'ram," for perambulator, becomes *thlam:* the *th*, with an extra aspiration, almost $\chi\theta$. A few weeks later this was simplified into *khlam*. There seems to be a difficulty about initial vowels: "egg" becomes *lleg* (or perhaps *yleg* would be nearer), which I can only write symbolically: the sound marked as *ll* or *yl* is something like the Spanish *ll* with an aspiration. A few days later the initial sound was more sibilant and less vocal, say (symbolically) *zhy*.

Early in March (at 20 months) we noted the first attempt at sustained conversation. The child was looking, or pretending to look, for a lost object on the floor. We told her she would get her hands dirty. On this she exclaimed, in a tone of dissenting interrogation, "Dirty!" *(da-ti)*, and then, after looking at her hands, holding them out to us, and with triumphant affirmation, "Clean!" *(kle'n)*. Here we have not merely vocal signs, but intercourse by speech—one may say an elementary form of repartee and argument. She can now say "yes" (*es*, or *is*, sometimes *as*) and "no" in answer to questions with fair intelligence, though she sometimes answers at random, and sometimes gives the wrong answer on purpose for a joke. One of her new words is *fa-ni* (funny), which she uses in a wider sense than adults, for anything that pleases and surprises her. The imitative name for the cat is dropped, and she now says (for "pussy") *pü-si* (*ü* as in South German, coming very near to *i*). "Funny" is also used to disguise fear, *e.g.*, on being introduced to a strange dog. When left to play alone she talks to herself constantly. The staple of one of these monologues (Mar. 10) was *á-diá* (formed on "O dear"). I half suspect a dramatic intention in her proceedings.

The peculiar short sound of English *a* (represented by *æ* in Mr Ellis' general notation) is now forming. She can say "bag" nearly like an adult. But as a rule she still substitutes (Indian) *a* or *á*, saying, *e.g.*, "cub," or "kahb," for "cab".

21 m. Progress is now less marked and rapid. New words continue to be acquired, but the power of putting them together does not seem to increase much. The child is, however, now more or less able to answer direct as distinguished from leading questions. Thus, when she had been paying a visit to some relations and cried to go home, she gave afterwards (Mar. 17) a pretty connected account of it in monosyllabic answers. Q.: What did you do to-day at ——— ?"—A.: *Klai* ("cry"). Q.: And what did you cry for?—A.: *Ham* ("home," *i.e.*, I cried to go home). Also, when told not to handle a forbidden object, such as a knife, she will say, in a tone of intelligent acquiescence: *no—dá dá (i.e.*, I may not have that, but *dá dá* may). One trisyllable is in common use: *Tenisi* = Tennyson, an illustrated edition, which divides her attention with *Vats* (Watts).

As to sounds, *r* is generally replaced by *l*, or *ll*, or (approximately) *hl: hlan* or *llan* = "run". The prosthetic initial sound for words beginning with vowels is now *zh*, or an aspirated *y*.

She begins, too, to put now and then a substantive and adjective together: "clever baby," "happy man" (in picture); the meaning of which she now seems to understand well enough.

21½ m. There is now a distinct advance in constructive power. Substantives and adjectives are freely put together (*e.g.*, "dirty boots"), and I have noted one instance of the use of a real predicate so as to form a complete proposition. The child had been told, half in joke, that cabs were dirty as compared with her perambulator. For some days she had been accustomed to say "dirty" on the mention of cab, "clean" on the mention of perambulator. Now she made the whole statement for herself: *Kábz dati klam* klín* ("cabs dirty, peram' clean"). She still talks constantly to herself, and with a continuity giving more or less evidence of continuous trains of thought. I am informed of dramatic conversations with her doll, such as pretending to make it look at things, and describing them to it.

The doll furnishes an illustration of the process of making generic names. A doll was named "Bessie," in honour of the donor: some time afterwards another doll was given by another person. The child insisted on calling this "Bessie," too. She does not seem to feel the want of a specific distinction between the two dolls: when she does wish to speak of one as distinct from the other she says "other Bessie".

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* Simple *k* is now substituted for the initial *kh* in this word; which again, as noted above, had replaced a more complicated aspirate sound.

In like manner, *bet* (bacon) is used with a generalised meaning, nearly = ὄψον, to denote any dish that appears at breakfast.

22 m. Vocabulary and power of expression are gradually and steadily extending. A certain number of the words called symbolic by some recent philologists have been mastered: "now," "there," "other," or "'nother," are in constant use; the child often says "there it is" (in the compendious form, *zhátis*), and almost always adds "now" to the statement of anything she wants (*e.g.*, "Bring—cake—now"). "Again" is also in use, though not quite so much. The following approach to a complex sentence is reported: "Out—pull—baby—pecs" (spectacles). Simpler combinations are freely used: subject and verb, as "run away man"; or, subject, verb, and *régime*, as "mama get Bessie". The sense is generally optative or imperative, but sometimes indicative. She often says *es es* (yes) to emphasise her demands, as: "Es es—baby's book there".

Articulation is firmer, and very distinct. She says "good-bye" better than most adults, but making two separate words of it, and dwelling strongly on the "good". The vowel-range is increased, but *a*, *á* are still favourite sounds. Of consonants *ch*, *j*, and *th* (both sounds) are still imperfect (*th* hard mostly becomes *s*, *th* soft, *z*), and consonantal *r* is not yet formed at all.

At 22 months 1 day, a real verbal inflexion was used. She said of a younger child, "naughty baby"; and being asked why it was naughty answered without hesitation: *klaid* (cried). That she appreciates the general force of the inflexion is shown about a week later by her using "comed" for the participle "come".

At 22 months 10 days, a sentence is noted *ex relatione*, containing not only a direct but an indirect *régime*; "Annie—gave—baby—sugar"; and again, a day or two later, "Dada give *bátá* (butter, *i.e.*, bread and butter) baby". Talk to the doll is now very common, as: "Bessie look," "Bessie walk away": sometimes the child repeats to the doll what has been said to her by elders. She also puts the doll to bed, takes it out for a walk and brings it home, etc. On one occasion she scolded it for two or three minutes, saying "naughty Bessie" with much gravity. We could not discover what the supposed offence was. I may observe on this that I have no reason to doubt that all the play with her doll is purely and consciously dramatic, not animistic; in other words, I have seen nothing to indicate a belief that the doll is really alive, nor is there, so far as I can observe, any tendency to attribute life to other inanimate objects. I think the child is perfectly aware of the difference between animals and things, though I am unable to give specific reasons for this impression. "Again" is now used to strengthen "more": when she wants anything repeated she says "more 'gain". The following is an actual short conversation, on seeing an ivory ring spun teetotum-wise: "Baby do't. . . [after failure to make it spin herself] more 'gain. . . . ma-ma 'gain. . . . ma-ma do't. . . . [then turning to another object of interest] . . baby's *báts* (basket) . . ma-ma, take off cover".

Command of general and symbolic language continues to make almost daily progress. *Zát sing* (that thing) is now used to call attention to any desired object the name of which has not been mastered.

At 22½ months, besides the dramatic play with the doll, we have now some quasi-dramatic imitation of grown-up people's action. For some time the child has been accustomed to bring the newspaper to the breakfast table, and she always pretends to read it herself before handing it over. To-day, seeing her mother writing, she scratched the paper with a dry pen, saying, "Baby *lait* (write) ma-ma's letter".

23 m. Fluency and command of language increase. We note the first appearance of a *question, viz.*: "Where's pussy? baby look up 'tairs."

The palatals, dental aspirates, and the peculiar English short *a* (as in "hat") are still imperfect, and *r* is represented by *l*. When *s* comes before another consonant, one of the two is dropped. *K* is in some words confused with *p* or *t*. She says "oken" for "open," "kek" for "take".

The child takes pleasure in quasi-dramatic games and actions with her parents as well as with her doll. Sometimes, when saying good-night, she pretends to refuse a kiss and lets me make a *fausse sortie*, as if annoyed or indifferent, and then calls "dada come back" (or "comed," for she uses this form for present and past indiscriminately, which compels me to set a lower value on her appreciation of inflexions), and gives the kiss after all. (At 23½ months, however, she uses "made" correctly.) I think she considers the thing a joke, but not without a shade of fear that it may be taken seriously. The last time, she completed the performance by saying "goody girl" in a tone of extreme self-complacency.

Seeing lines of dots on a printed page, thus . . . . . (in a table of contents), she said, "Oh! pins," and made repeated attempts to pick them out. This would seem to have some bearing, however slight, on the gradual character of the process by which our vision of solid objects and perceptions of things as in three dimensions, is acquired.

She now has a settled formula to ask for things she wants, and also to express acquiescence when told she is not to have them, *e.g.*, "baby have *pápá* (pepper)", "baby have *pápá* no." The "no" is not given as it would be by an adult, as a distinct exclamation following a pause. There is no stop and no raising of the voice. When she is impatient, "baby have, baby have, baby have," is rapidly repeated. She is very persistent in trying to get a desired object, and if she cannot have it at once does not give it up, but proceeds to make the best terms she can; *e.g.*, she asks for bacon, and is told it is not for her, but her parents must have it first. She answers, "*then* baby have bacon". Here is an elementary notion of bargain and compromise. The child is already πολιτικὸν ζῶον.

Bacon has lost its former generality, meats which appear at breakfast being now divided into egg, bacon, *sis* (fish), and beef. Once, after calling a new dish "bacon," and being corrected, she said "bacon no"—recognising, one may say, the logical division into bacon and not-bacon. The child is now able, however, to take up new words very quickly. She has reached, so far as concerns the names of things, the advanced stage of knowledge in which the provisional character of generalisations is recognised.

At about 23 months 10 days she cried violently on finding that her doll's head was coming off, and was pacified only when it was put out of sight with a promise that it should be mended. Her own report of the cause of her grief was "Bessie's head poor". The dramatic personification of the doll may probably count for something in this. But one is not strictly entitled to assume that she would cry less for damage to any other toy.

There are increasing signs of a desire to find explanations. Seeing in an illustrated advertisement a device of a griffin rampant supporting a kind of banner, the child invented a meaning of her own for it: "pussy *ling* (ring) bell". The figure of a man making pottery, which was part of the same advertisement, became "man open door," so as to form a single composition with the griffin. On hearing sounds in the street, knocks at the door, &c., the child readily (and as a rule spontaneously) assigns causes for them, saying "band,' "organ,'" "man," "post," &c., as the case may be. Strange sounds, and at times sounds of a known class coming from an unfamiliar direction, appear to frighten her.

I should add that the greater part of these notes was already written before I saw M. Bernard Perez' very interesting book, *Les trois premières années de l'Enfant* (Paris 1878). I have retouched and rearranged them as little as possible, preferring the certainty of leaving them in an inartificial state to the risk of spoiling by manipulation whatever value they may possess as records made at the time.

F. POLLOCK.

Note-Deafness.—As a sufferer from the infirmity discussed by Mr. Grant Allen in the last number of MIND, I have read his suggestions as to its cause with much interest, and subjoin a few particulars for comparison with the case he has described. The writer's parents were both of average musical capacity, with constitutional tendency to deafness on one side. Two brothers with at least average hearing for ordinary sounds, are altogether wanting musically. As a child the writer was frequently treated for deafness; at three-and-twenty enlarged tonsils were removed, since when attacks of deafness have been rare, and always consequent on a cold. This, so far as it goes, tends to connect insensibility to quality of sound with defective sensibility to quantity—unlike Mr. Grant Allen's case, where the hearing was more than ordinarily acute. Like his subject, the writer is conscious of the difference between a full rich tone and the reverse; but finds music at its best only a pleasant noise, and the wailing of an Æolian harp as significant as an elaborate melody. The tone of different bells is also scarcely distinguishable. The defect was naturally discovered at an early age in the process of "learning music". Operatic airs played through by note—and even learnt by heart—might be strummed in the very same arrangement by half-a-dozen schoolgirls without leaving any mental impression of the sound or sense of the air; this would be recognised, if at all, by extra-musical considerations, such as the relative position of a shake or a run or rest. In playing from memory the ear gave absolutely no help: there was some recollection of the printed notes, but for the most part it was an affair of physical association between different movements of the fingers. At the same time, the attempt to distinguish the sound of different chords, after a painful effort of attention, always ended in a random guess. No interval less than a fifth can be distinguished with any degree of certainty, and even in the case of greater intervals the ear is easily misled by added volume, or force in striking the higher note. The theory of music or "thorough bass," taught not very scientifically, threw no light on the darkness, the writer composing chords and sequences by rule, and failing altogether to apprehend how other pupils either struck out the exercise at once on the piano, or at least verified and corrected by ear what they had written by rule. By contrast with the complete absence of the sense of tune, the sense of time seems fully developed, though it is probably not above the average, and does not include a very correct ear for metre or quantity in verse. Regard for other people's ears prevented any attempts at singing, and the writer is conscious of complete inability to go up or down the scale in an orderly manner; nevertheless, there is a dim sense of difference between singing in harmony with other people, and singing out of relation to them. The feeling bears no resemblance to the musical perception of a discord; it is vague, and—unscientific as such a description may seem—rather suggests an affection of the muscular than the auditory sense. Not to make too much of the matter, if anyone else were singing a correct second, the writer has an impression (which may be unfounded) that she would be conscious of any failure to keep in unison. It is a question, however, whether this consciousness might not be rather connected with the more or less disciplined movements of the throat than with aural perceptions (*cf.* the feeling of "keeping step"). As to the alternative explanations offered by Mr. Allen—ataxy of the nervous centres and malformation of Corti's organs—the writer has always instinctively inclined towards the former; the only difficulty alleged is that of explaining the indifference of the note-deaf to a discord, and this hardly seems greater on one hypothesis than on the other. We know that the *cause* of a discord is such or such interruption of an orderly series of vibrations; but is not the *sense* of discord rather that of a jar or grate than of an interruption? An ear that does not perceive the natural harmony of congruous vibrations must fail, by the same incapacity, to discern the harshness of incongruous combinations; it receives the sound without apprehending its special qualities. It is hard to say whether note-deafness most resembles colour-blindness or short-sight; a short-sighted person sees a blurred outline vaguely filled in, where to sounder organs there appear a number of sharply-defined details. Similarly the note-deaf hear a succession of sounds, *within which* a number of related gradations are apparent to normal ears; but here the analogy stops, for it certainly appears that the distinction between a scale and a symphony is as special as that between green and yellow. Perhaps it would be worth while, from this point of view, to try the effect of an ear-trumpet or microphone, so as to ascertain whether the differences between a magnified third and a magnified fifth was more perceptible than that between ordinary sounds. It is to be hoped that the progress of science may suggest some mode of vivisection which may throw light on these interesting questions; but if the present high degree of musical sensibility is a development, and the primitive savage as insensible to musical intervals as Mr. Allen's subject and the present writer, it would probably be agreed that the change is more likely to have taken place in the elaboration of nervous sensibility than in the physical structure of the ear.

EDITH SIMCOX.

In the *Scottish Musical Times* for June 1878, after some extracts from my article on 'Note-Deafness' in the April number of MIND, a case somewhat similar to that of Miss Simcox is given in detail, from which the following passages are extracted. The person referred to, a pupil of the editor of the paper, thus describes her own auditory powers:—

"If a note be struck on the piano I cannot tell which one it is, nor do I know the difference in sound of one note from another. I never recognise a tune either in singing or playing. If any one played a tune which I had been practising for ever so long, I should not know it. When practising, I do not know whether I am playing in tune or not, nor do I notice wrong notes unless they make a horrible discord. I am fond of listening to music for a reasonable length of time, but would tire sooner than most people."

To this account the editor adds the following remarks, among others:—

"We have personally tested this young lady's musical capabilities, and can safely assert that, so far as discrimination is concerned, she gives a moderately accurate account of herself. . . . She plays the piano as well as most pupils who have studied in the popular way for two, three, or even four years; and she reads much more easily than the average of such pupils. . . . Having explained the production of voice in singing, we directed that long notes should be practised. After five or six lessons the result has been as follows:—She has succeeded in singing the notes *C*, *D*, and *E* sometimes in accurate tune, but never to be relied upon. After various experiments we find that these are the notes upon which the voice is used in speaking. Our pupil cannot say that the notes of a perfect fifth or an octave are different ones when they are struck on the piano separately, while she recognises their harmony when sounded together. At the same time, she readily recognises the difference of vocal sounds (or rather that they are not the same, for she has no idea of the amount of difference). She immediately recognises the difference between harmony and discord, and has a limited perception of difference between all sounds, except those of a fifth or an octave."

It will be observed that this instance differs in some important particulars from that originally recorded by me, especially in the ability to discriminate between harmonies and discords, which in my subject's case was entirely wanting. GRANT ALLEN.

IX.—NOTES AND DISCUSSIONS.

The Genesis of Disinterested Benevolence.—Disinterested benevolence, about the genesis of which so much has been written, is a name for two distinguishable things. It is in some cases meant to designate that feeling which prompts us in a special instance to do good to some individual object. In other cases, the same name is applied to the quality of the mind which predisposes to all special benevolent impulses. But these two are of course not the same thing, and when I inquire into their origin I shall have to consider them separately. This, however, I shall do in an order the reverse of that commonly adopted, beginning with the special sentiment, and then inquiring into the general quality of the mind.

Benevolence, in the first sense, may be defined as the wish that the object of this feeling may be well,—as the wish for the welfare of something. In so far as, with a certain class of beings, welfare is accompanied by pleasure or happiness, benevolence is a wish for the pleasure or happiness of the object. But I should think it a great mistake to define it in this latter way. It would reduce the field of benevolence by excluding all inanimate beings, and make the definition far too narrow. Benevolence, I assert, can be felt quite as well towards inanimate non-sentient beings as towards sentient organisms. It can be felt towards any being of which it is believed that its welfare or perfection can be procured. As the parent towards his child, the master towards his dog, so the sculptor feels benevolence towards his statue, the author towards his book. The perfection of it makes him happy, its imperfection or destruction causes him pain. Whether the object is a living being or not, whether it is real or imaginary, the sentiment of benevolence is the same in all cases.

Disinterested I shall call such benevolence, if its origin cannot be traced directly to some egoistical motive or to some other moral or æsthetic feeling. Gratitude, which is dictated by a feeling of equity, admiration, which takes its orgin in an æsthetic judgment, or the aversion to inflict pain, which is the result of our habits, I shall not call disinterested benevolence, and in this short essay I do not inquire into their origin.

To explain the growth of the special sentiment of disinterested benevolence I must assume a certain number of qualities of the mind, the existence of which, however, has generally been admitted. Whether these qualities are native or acquired is here of no importance; all I require is that they be found in man very soon after his birth. These qualities are, first, the impulse towards self-preservation and self-augmentation inherent to every living organism, and without which it could not exist and develop itself; the wish to be and to be more and more, in a word, to grow. The second quality of mind which I have to assume is the consciousness of existing, not only as a passive sentient being, but as an active being too. And these two qualities once admitted, there follows from them a third, which is the wish to exist as an active being either actually or potentially, to be either acting or capable of acting—the wish for power. The fourth quality is that known under the name of capacity of associating ideas, and the fifth the capacity and tendency of the mind to fuse or confuse such associated ideas, so as not to distinguish them any longer from one another. The first four qualities just enumerated have long ago been generally admitted and amply illustrated. The fifth, that of confusing ideas, has likewise been admitted; it has even been most admirably illustrated in the works of many a philosopher of great repute, but I am not aware that its importance for morals has ever been sufficiently insisted upon.

The specimen case of confusion is that between the ego and the body. All men in early life confuse the two notions of self and body, and most men continue to do so for ever. Here already the confusion produces a kind of disinterested benevolence; we feel well inclined towards our body irrespective of any advantage to ourself.

But it is not from this simplest form of the mental quality that moral benevolence takes its rise. Besides the confusion just spoken of, there is another, the outflow and consequence of that between body and mind, nearly as common among children and uneducated men. It is the confusion between the acts of ourself, of our mind, and those of our body; between intended effects and willed acts.

This confusion is to be found in the laws of all rude and semi-barbarous nations. Their criminal codes punish the result of an act irrespective of the intention of the agent; they make, for instance, no difference between murder and manslaughter. In more civilised countries, where generations of lawgivers have for centuries developed the theory of criminal responsibility, the law is even now far from perfect. The result of an act, even when not intended, continues to be taken into account for punishment. A man who would be let off with a small fine for an illegal act producing no direct harm would be fined more heavily, or even imprisoned, if by such an act some harm was unintentionally done. Even if the legislator wished to correct this irrational state of the law, the general opinion of the uneducated majority would prevent him from doing so. It will be long ere the theory of criminal responsibility is generally understood.

But if in criminal law, which it is the interest of so many persons to clear up, the confusion still exists, how much the more will it continue in those matters where no great interest is at stake? If a man kills another man, fear of punishment, fear of his own conscience, will prompt him to consider whether the death was intended or not, whether he is guilty of murder or of simple manslaughter. But if a man by mere chance does some good to another man, there is nothing which incites him to a similar mental effort, while on the contrary the agreeable sense of power which the consciousness of the effect produces, the gratitude of the benefited individual and the approbation of society, will make the idea that he is the author of the benefit pleasant to him and prevent him from too closely analysing his motives. He will easily assume that he is the author of the benefit, and so it happens that when an act of his body has produced a beneficial result upon some one else, an average man thinks that he himself has done good to that individual.

From this confusion real disinterested benevolence will take its origin. The agreeable sense of power, produced by the unintended beneficial effect, will continue as long as the agent can remember that effect. This, however, will only be the case if the benefit persists for some time, so that it may hereafter be remembered, and it will be all the more the case, if that benefit continues for a long time so as to be actually perceived. There is then an inducement so to act that it may persist. This inducement is of course very weak at first, and will produce no action if there is not a considerable spontaneous energy. But there is already a germ of benevolence, the wish that a benefit conferred upon some individual may subsist. And if this sentiment under favourable circumstances produces further action, this time intentional, it will become stronger thereby; far more power is felt to be exerted and more interest is consequently felt in the effect. The wish to maintain the effect increases in proportion to the exertions already made, and it may finally become strong enough to overcome counteracting influences of considerable moment.

But this is not all. As it is a condition of the persistence of the beneficial effect, that the being upon whom it has been produced continues to exist, a secondary wish, very slight at first, will be generated, that the whole individual may continue to be. At the same time that the wish for the persistence of the beneficial effect becomes stronger, this secondary feeling augments and may produce action tending to the conservation and the welfare of the individual benefited. But as soon as the fact is realised that good has been done to the whole individual, this new secondary benefit will become the starting-point of a growing disinterested benevolence, directed no longer towards a single quality but towards the whole being. The secondary feeling may now grow much quicker than the primary one, which may in due time be entirely forgotten, and nothing will remain but true disinterested benevolence towards the individual. A benefit conferred by mere chance has produced true devotion.

To illustrate my meaning, which otherwise might remain obscure, let me adduce an example. A man had to throw away some water, and, stepping out of his house, threw it upon a heap of rubbish, where some faded plants were nearly dying. At that moment he paid no attention to them, took no interest in their pitiable state. The next day, having again some water to throw away, the man stepped out at the same place, when he remarked that the plants had raised their stems and regained some life. He understood that this was the result of his act of the day before, his interest was awakened, and as he held a jar with water in his hand, he again threw its contents over the plants. On the following day the same took place; the benevolent feeling, the interest in the recovery and welfare of the plants augmented, and the man tended the plants with increasing care. When he found one day that the rubbish and plants had been carted away, he felt a real annoyance. The feeling of the man in this case was real disinterested benevolence. The plants were neither fine nor useful, and the place where they stood was ugly and out of the way, so the man had no advantage from their growth. Nor had the man a general wish to rear plants, for there were a number of other plants sorely in want of care, but to which the man did not transfer his affection. He had loved those individual plants; the benevolence towards the effect he had at first produced had by confusion become benevolence towards the plant itself, and the first feeling had been entirely forgotten.

In this case there was a complete confusion between the effect and the recipient of it, rendered easy by the fact, that by continuing the special benefit, the whole welfare of the plant was assured. But such is not always the case. If the benefits have all been of one and the same kind, if the benefactor has been prevented from extending the sphere of his beneficial action, the feeling of benevolence will remain in its primitive state, directed towards one quality of the individual. However strong it may become, it will never extend to the whole being.

Cases of this kind are by no means rare, but they are generally misunderstood. We assume that A feels benevolence towards B, and that if he lays so much stress on a single quality of the latter, this arises from an error of judgment as to what is good for B. In reality the error of judgment is ours, and the man whose folly we condemn is intellectually quite in the right. Having never learned to love B but only to love one of his qualities, A favours this latter even to the detriment of the holder.

In the first example adduced by me, benevolence took its origin in a chance act, no effect at all having at first been intended. This is not necessarily the case. A benefit may be intended in a limited degree, for instance as an equivalent for a benefit received. The spring of action here is gratitude, based on equity. But while this benefit is conferred, a benevolent feeling, first, towards the special quality furthered, and, finally, towards the whole individual, may arise in exactly the same manner in which it arose from a chance act. Gratitude will be forgotten and disinterested benevolence felt instead. One moral feeling has here given rise to another; equity to disinterested benevolence. In our social system this latter genesis will be most common; it is only where social relations are rare, that benevolence will commonly be produced as a consequence of a chance act. But in all cases, it will be a necessary condition to the perfection of the feeling, that it be extended to the whole individual, as else it may often tend rather to injure than to favour this latter.

My meaning, I hope, is now sufficiently explained. It remains to be seen how far my theory is in accordance with the known facts about benevolence. For this I hold to be the indispensable test of every psychological theory—that it will offer an easy explanation of the facts known from experience; and this test I shall now apply.

The strongest feeling of benevolence on record is probably the love a mother bears to her infant child. The strong feeling that she has given it life, that the child is her creation, explains the energy of the affection. This is further strengthened by the consciousness, that by nourishing and tending her child she confers constantly new benefits, indispensable to its welfare. But as the child grows up, this benevolent feeling may, with mentally undeveloped persons, lose much of its power. When the child becomes independent, when it is no longer in want of the maternal care, the maternal affection will cool down or turn towards a younger child still in need of its mother's help. This is already apparent in the lower races of mankind, but much more so among the higher animals. Among these latter a mother will risk her life to defend her young, but when they are grown up, she does not care for them in the least.

Among uneducated people paternal affection is seldom very strong towards an infant. Some culture of mind is necessary to realise all the indirect benefits the father at first confers. But when the direct influence becomes considerable, the paternal affection augments and may assume a very great energy. Among animals paternal affection, I think, exists only in those species in which the father assists the mother in rearing and feeding the little ones, as for instance among birds.

During the proscriptions of Marius and Sulla, there were many sons who out of fear gave up their father, but it was never known that a father had denounced his son; a fact that somewhat startled the Roman moralists, who were unable to explain it. Upon my theory the explanation is easy enough. In Roman society the son could confer no benefit upon his father, and the mere feeling of gratitude for the benefits received from the parent was not sufficient to counterbalance the fear of the bloody edict. Filial affection can indeed become very strong, but whenever it does, it is easy to perceive that the parent has in some way become dependent on the child—has received benefits from him.

The relations between man and wife are such that the two are called upon to complete one another—that they have a fair opportunity of conferring great benefits without a corresponding sacrifice or exertion. The facility renders the feat all the more attractive, and strong affection follows upon it.

That friendship is based upon numerous mutual benefits is a fact daily seen. Prevent a friend from doing you good, impress him with the idea that he is of no use to you, and his affection will cool. But ask a man for little services he is ready to render, let him know and keep in his mind that he has conferred a benefit upon you, and he will like you all the more for it, become interested in your welfare, and finally feel real devotion for you. I have never known the experiment to fail.

In public life those who receive the greatest benefits from the community are not the men most ready to make any sacrifice for the general good. Patriotism, I think, is not exactly rampant in workhouses, though the inmates owe everything they enjoy to the munificence of the public. The pauper who has done no good to his country, who, on the contrary, is a continual burden to it, feels no benevolence towards it.

On the other hand, a man in the higher ranks often enters the public service, either to earn in an easy way a sufficient income or out of ambition, and in order to gain fame. If such a man by his energy or by some distinctive talent becomes useful to the State, in most cases he will become a really patriotic citizen. The official will devote more than the strictly due time and energy to the fulfilment of his task, the statesman will give up his personal ambition, and often risk what must be dear to him, popularity and power, in order to carry the measures he thinks necessary to the welfare of his country.

And when some extraordinary man has made a discovery, has introduced a measure or proclaimed a truth beneficial to the whole world, the sentiment that he has been useful to so many millions of people gives a distinctive character to his benevolent impulses. Such a man, the benefactor of humanity, will refuse his sympathy to no part of it; he will at once feel benevolence towards any man with whom he comes into contact. He knows that he has done him some good, and is well inclined towards him.

I hope I have now shown that my theory agrees with the facts known by experience, that it can bear the crucial test. That being so, I think myself entitled to hold that the genesis of every single benevolent sentiment is that some good is done to an individual, either unintentionally or from another motive than that of disinterested benevolence, as from gratitude, sense of equity, religious feeling or hope of advantage, and that the benefit itself being loved by its author, this love or disinterested benevolence is by confusion extended to the individual upon whom the benefit has been conferred and maintained. It now remains for me to explain, how from single benevolent feelings there arises a general benevolent disposition, how the benevolent character is formed.

I think we shall again have to trace back the origin of the benevolent disposition to confusion. After having felt benevolence towards a number of individuals of a class, we come to confuse them with one another, and to transfer part of our feeling to the whole class. When any member of it presents itself, benevolence is at once excited.

That such is the case will appear more clearly if we remember how often we are favourably disposed towards a perfect stranger, simply because in his outward appearance, his manner, his voice, or any other characteristic, he is like some other person we love. We have a confused but strong benevolent feeling towards a cluster of attributes belonging to the friend we have learned to cherish. Some of these attributes are suddenly and strikingly presented to us, and we feel well-inclined towards them. We confuse the attributes with the present possessor of them, and benevolence is felt towards the stranger. In this case the genesis is so clear, the confusion so glaring, that they cannot be overlooked. In other cases they will not be so apparent, but the process will be the same. The cluster of attributes—man, Englishman, or man of a certain type—is liked, because a number of persons dear to us possess these attributes. Men of another type or nation are often not liked at all, even by such people as are generally considered benevolent. The difference in this case is stronger than the likeness, and no confusion is made. What holds good of men holds good equally of all other beings. I have observed this genesis in myself; formerly rather hostile to dogs, now that I have a dog myself, I feel well inclined towards the whole canine species, but most to that part of it which has some characteristic feature in common with my favourite. This then is the genesis of the benevolent disposition, that after having by confusion become well inclined towards certain things, we feel the same benevolence towards each of their attributes; when we find these attributes in other things, we feel equally well inclined towards them, and by confusion extend this benevolence to the individual possessing the attribute. Hence it follows that the greater the diversity among the individuals towards whom we acquire a benevolent feeling when young, the wider the range of our sympathies, of the benevolence we feel at once towards those with whom we come in contact—a fact of some importance in educational science.

I do not know whether I shall have convinced my reader of the soundness of my theory. Limited space and an inadequate power over the language may have prevented me from attaining this end. But the question is so important that even the mere suggestion of a possible theory might be accepted as of some use towards the final solution of the problem, and as such I offer the foregoing pages.

PAUL FRIEDMANN.

Mr Sully on Pessimism.—I hope that the appearance, in a recent number of this Review, of Professor Bain's observations on Mr Sully's important work will not make it seem presumptuous in me to offer a few further remarks upon it.

Were I to pass the most general criticism I could think of on Mr Sully's book, I should say that its true subject hardly corresponds with its title: it is in fact better than its promise. To be sure, most of its historical and critical matter is concerned with Pessimism; but along with this, and continuing when this is done with, runs a discussion of wider scope. Optimism, too, has its history briefly narrated, is examined, and rejected. It is made quite clear that the author rejects, in their extreme form, both these opposite estimates of the world. Still, what with the title of the book and the principal incidence and merciless rigour of its polemic, it often looks as if the author held a brief against the Pessimists; and sometimes one is not quite sure that the situation has not really a little disturbed the impartiality of his judgment. This is the more to be regretted, because, although just at present Pessimistic views are (perhaps but temporarily) prominent in literature; in England, at least, it is Optimism much more than Pessimism that needs to be made to know itself, and that piecemeal and exactly, not by mere declamation,—of which there has been enough, with small result. Accordingly, it appears to me that it would have been better to criticise under some other title both Pessimism and Optimism (the historical matter might perhaps have formed a separate volume), and then to start anew to estimate scientifically the worth of life. As it is, a scientific estimate of the worth of life occupies the latter half of the work; and this, although it receives a suggestive rather than an exhaustive treatment, is the true pith and essence of the whole. It is here that the author's best powers come into play; and it is this portion of it which makes the work most valuable at present, and must give it its permanent place and importance in philosophic literature.

In attempting to estimate the worth of life, Mr Sully first examines the method of summing up particular pleasures and pains, in order, if possible, to strike a balance; and he rejects it, for the present at least, as impracticable for many reasons: since we do not yet sufficiently understand the causes of pleasure and pain, nor their comparative frequency in nature, nor can we precisely remember or compare our own experience, nor interpret that of others.

He next tries whether any better result may be obtained by substituting for scattered pleasures to be sought and pains to be avoided, a more coherent idea of Happiness as an end. His idea of Happiness deserves attentive consideration. It is not merely, as usual with Hedonists, net Pleasure; but, whilst ultimately resolvable into pleasure, is immediately conceived as the sum of the permanent causes of pleasure (such as Health, Wealth, &c.), and these ranked as objects of desire in the order of their importance. The last point raises a doubt whether such an idea can be definitely framed as long as the hedonistic calculus remains impracticable; for how without it can we compare the values of the permanent causes of pleasure?

But this difficulty does not really much affect Mr Sully's purpose: for the chief advantage which Happiness, as something permanent, has over fugitive pleasures is, that it offers a better mark to the man who tries to make a good thing of the world, whether or not it be so in its own character. And here the author brings out the curious infelicity of the German Pessimists' choice of Will as the principle of the world and fountain of evil. For it is precisely Will which must enable us to escape from evil, if any escape is possible. Even admitting that the causes of pain in the world are more numerous than the causes of pleasure, still, if we are allowed to assume (what the sane absolutely will have granted them) that pleasures have a real existence and a positive value, it is the part of Will to select these pleasures springing scantily by the way, as one plucks a bouquet in a weedy garden. Pessimists who call the Will blind, and identify it with Reflex Action, Gravitation, and Heat, find it easy to overlook this fact; but such confusion of language has no foundation but the *Machtspruch* of a system-maker—a rude denial of one of the oldest and best established distinctions in Mental Science.

Will is, in fact, a source of good in two ways: first, as deliberate choice; and, secondly, because activity is itself to a great extent pleasurable. Whilst the Pessimists describe all work as irksome and painful, the pleasure of activity is a topic which Mr Sully dwells on so much, and returns to so often, that the more torpid sect of mankind must suspect a prejudice of the active temperament.

To return to the author's idea of Happiness: much as I admire it, I cannot help feeling that it is dwelt on somewhat too much to the exclusion of countervailing considerations. The pessimistic reader will certainly reflect that there exist in Nature permanent causes of pain as well as of pleasure; some of them constantly apt to frustrate the efforts of the intelligent Will, some of them quite above the Will, and for ever beyond its reach. And thus to confront the idea of Happiness, there arises the menacing idea of the world's Misery. It seems a thankless task to construct this idea, though it would have to be done in making a complete estimate of life's value. Here it will suffice to indicate the elements of misery that correspond with the powers which Mr Sully enumerates as some of the elements of Happiness. Over against Wealth we may set the principle of population and the practical exhaustibility of our planet's resources. The first of these Mr Sully notices, and justly observes that it is within the control of an intelligent community: but the second he does not enough consider, and perhaps it will prove less amenable to reason. He next lays stress upon Interests, or permanent spheres of grateful activity: but in the other scale lies the fact that few have the power of choosing their chief sphere of activity, their business; and that of these few the most must exercise their choice before they know either themselves or the world. And of other interests the principal, Politics, whilst daily becoming more pressing, is daily becoming less grateful, because the possible influence of an ordinary man grows daily less: whilst the casting vote on every question falls into the hands of a mob compounded of the residuum and the scum. Art and Science require what few possess, leisure—to say nothing of sensibility and intelligence. Thus, as Wealth is opposed by social pressure and the poverty of the earth, Interests are opposed by social pressure and the poverty of the spirit.

Wealth and Interests our author calls external factors of Happiness: the internal may be summed up under Culture, or the attainment of permanent spiritual possessions. First, there is Moral Culture: and it certainly surprises me to find hardly any allusion to the opposite of this. For the chief internal factor of Misery is Sin, a permanent cause of suffering equally important to theologian and naturalist: and the sense of this has surely been a perennial source of the deepest Pessimism. And so every other sort of Culture finds its own particular Satan within, whose writhings grow more horrible the more narrowly he is imprisoned and bound. Schopenhauer's doctrine of the fixity of character is one of the many half-truths that make his writings plausible.

The task of harmonising the various elements of happiness, allotting to each its place in a scale of values, and regulating our endeavours accordingly, we have seen to involve at present an insoluble problem. To lay a plan of life, too, is perhaps harder now than it was a thousand years ago; for although we know more of the world and what may happen in it, we are at the same time exposed to the incursions of unforeseen influences from a far more complex and more extensive region. And, finally, the higher powers of Will, to which Mr Sully rightly attaches such importance, the power of wisely controlling desire and regulating attention, is the possession, and, I fear, the wish of very few. To wish for anything men must know what it is; but it may be doubted whether the majority are yet able to grasp the idea of self-control in its widest sense; for although it has again and again been presented to them, they have never retained it, but have readily surrendered it a prey to the narrow and vulgar glossing of tenth-rate interpreters.

Moreover, there is a conspicuous element of most men's ideal happiness, which our author does not mention, namely, Superiority. And this omission the Pessimist, whose possible reflections I am representing, may attribute to conscious weakness; for superiority in one man can only be gratified at the cost of correlative inferiority in others, usually in many others, though each of the many may desireto rule as strongly as the one, or may resent his supremacy as deeply as he prizes it. Our country, as perhaps about to become "one vast camp," is a comfortable prospect to those who expect to pose amidst it in commanding attitudes, but less exhilarating to citizens who prefer to be their own masters. The passion for power over others may still be needed for the welfare of society: but nevertheless it must be eradicated before social welfare can be complete. Here, then, we have a permanent power which is at once an element of the happiness of some and of the misery of many others; and at once a condition and an obstacle of progress.

Still, the world may improve. Mr Sully is ready to grant (rather, I imagine, for the sake of argument, than that he really thinks so) that in the experience of mankind hitherto there has been no balance of pleasure; and yet, he urges, it may be well for the world to have existed, if such an excess of pleasure can be secured hereafter as to leave a favourable balance on the whole. For the erroneous doctrines of Optimism and Pessimism, therefore, he would substitute Meliorism. And here the chief difficulty seems to be this:—We saw above that an obstacle to culture was want of leisure, and that leisure and wealth were both dependent upon a decrease of population. But if the population should decrease enough to lessen the pressure of competition, would not that result in a retardation of progress? 'No,' say some, 'for progress no longer depends on competition and the destruction of the incompetent, so much as upon education and conscious effort at improvement.' But that thought hardly reaches the bottom of the matter: for what makes people resort to education and self-improvement, what but the fear of competition? How many would be at the pains—irksome and bitter it is to them—to educate their children, or themselves if they were not convinced that it is their only hope of success? Thus the apparent displacement of Natural Selection by direct adaptation really comes to no more than this, that the forces of Natural Selection have reflected themselves in almost everybody's mind. So far, then, as the increase of happiness depends upon the development of individuals, it depends also upon the maintenance of competition; so far as it depends upon the increase and diffusion of wealth and leisure, it requires the decrease of competition. From these data, we cannot expect happiness to increase as fast as the species develops; and a process of development must be slow which depends upon the impulse of forces (such as the love of Superiority) that at the same time retard it. So much longer must the world endure to enable the future to make amends for the past.

And even then how unfair it must seem; though the dead do not feel it, nor shall we when our turn comes to be as they are. How unjust of Nature that nothing but the joys of men unborn should recompense their fathers' sorrows! That yet unrealised happiness is something to us who foresee it—far off its coming shines; but what has it been to them who did not foresee it, but prepared its way—like hordes of slaves doing a work whose purpose is hidden from them—driven by despotic instincts, arbitrary passions, and every sort of uninterpreted illusion? For whence but from their accumulated afflictions could the feelings which we call our noblest have sprung? The bitterness that sweetens so much æsthetic ecstacy is the salt stain of innumerable tears. What hope and folly, what disappointment, what yearning and remorse must have commingled and distilled in human hearts before the first notes of *Lohengrin* could awaken there such an exquisite response! And they who prepared that cup never tasted it, but were only sickened with its crude ingredients. I believe the recollection of such things will sadden mankind for ever. Unless they can feel that the past also was for its own sake not in vain, they must dwell in the shadow of an inexpiable wrong. And when the ignorant admiration and hollow mimicry which now serve instead of reverence for the past, have been outgrown and abandoned, men will not forget the debt they owe it; but will exhort one another to bear it in mind, will appoint days of commemoration, will desire even passionately to have shared those sufferings, and will pay with fasting and sacrifice just homage to the dead.

In conclusion, I may observe that Mr Sully has not shown so fully as he might have done the importance of his subject, especially at the present hour: it is, of course, clear to himself, but he has neglected to impress it upon the reader. I suppose it is not too much to say that there are now in Europe more people than ever before who do not expect another life; to whom, therefore, for the sake of both themselves and their descendants, the worth of this life is all in all. Upon this supremely interesting subject few books exist that can pretend to be impartial; and the present work is, as far as I know, by much the best of them.

CARVETH READ.

Prof. Jevons on Mill's Experimental Methods.—Professor Jevons's review of Mill's theory of Induction (*Contemporary Review*, April, 1878) seems to me to omit one or two considerations which are indispensable to a full statement of the doctrine, and consequently to involve some misapprehension of Mill's meaning. The gist of the article is given in the following sentences:—"These methods (the Experimental Methods) are the only means of proving the connexion of cause and effect; yet the methods depend for their validity upon our assurance of the certainty and universality of that connexion" (p. 89). "The Experimental Methods are of no validity, until we have proved a most general, in fact an *universal*, law, which can only be proved by these methods" (p. 91). The first of these sentences everyone will recognise as familiar in the *System of Logic*; the second must come, I think, with a shock of surprise to most students of Mill, for they are very well aware that according to him this universal law is never exactly proved, and does not stand to the methods in the relation of proof to the thing proved. On the strength of the apparent contradiction, however, Prof. Jevons rejects Mill's theory of Induction as being inherently inconsistent.

Confining attention solely to the question of consistency, I have in the first place to point out that Prof. Jevons has not taken into due account the fact that according to Mill the belief in Universal Causation is a slow growth. It is an integral part of the theory that originally generalisations from experience were determined solely by psychological motives—by belief grounded on association; and that such belief did not involve universality of causation, but merely uniformity in the class of objects observed. Only after such generalisations had been made to a considerable extent, and had been verified by experience, could the principles on which they rested be applied more widely. Not until the belief in uniformity had attained the dimensions of an assumption that all natural phenomena were subject to law, could a philosophy of induction be constructed. The methods of scientific induction might very well be applied in particular cases, and with merely particular import, before the assumption of general uniformity was made. Difference, *e.g.*, is the most familiar mode in which the more obvious and palpable connexions of cause and effect would be discovered, but it could not be generalised into a method, applicable to all phenomena, unless the assumption were made that all phenomena were subject to law. This is Mill's persistent contention. He repeatedly points out that inductive generalisations not involving the universal law are essential preliminaries to any statement of inductive methods which involve that law. I would refer in support of this to *Logic*, Vol. I., 345 *n.*, 355, Vol. II., 99 *n.*, 101 *n.*, 104-5 (7th ed.), passages which completely dispose of the argument on pp. 96-7 of Prof. Jevons's article.

It seems to me, in the second place, that Prof. Jevons, in supposing that we must have proved the Law of Causation before the Methods are valid, misapprehends Mill's theory. The peculiar relation between the universal law and the methods may, I think, be put in the following way. The methods are canons or rules of evidence, specialised statements of the signs of causal connexion. If our evidence exhibits certain signs, or satisfies the requirements of the methods, then we assume that causal connexion obtains among the phenomena, for this reason, that in such a case either causation is proved or the general law of causation is disproved. We do not say that causation is proved in this particular instance *because* causation is universally true, but we show that the evidence either warrants causation or disproves the universal law. In other words, our inductive reasoning exemplifies the special relation between the major premiss and conclusion of any reasoning.

It may be asked, why do we assume one alternative rather than the other? The answer to this will, I think, bring out a certain ambiguity in the word *proof*, which seems to have misled Prof. Jevons. The only reason is that the evidence *for* universal causation is incommensurably greater than the evidence against it. But the only *evidence* for an ultimate law of experience is conformity with fact; and to say that the evidence for universal causation is exceedingly great—so great as to be practically conclusive—is merely to say that mankind have so steadily found their inductive assumptions verified by experience that, in any instance where law is not at once apparent, the hypothesis of absence of law is not even momentarily admitted. Proof of all subordinate laws is given by comparison of the evidence in favour of them with the universal law, while the establishment of such laws lends additional strength to the belief in general conformity to rule. It is evident, then, that to Mill *proof* of the law of causation can never be in one sense absolute, for we have not exhausted the universe of facts (see close of Bk. III., ch. xxi.), but that the certainty with which it is held grows with experience, and has become so strong as to be equivalent in its effects to the certainty of a demonstrated doctrine.

I cannot think that Prof. Jevons has given due weight to this relation between the Universal Law and the Methods. Neither the note to p. 94 of his article, nor his reply (*Academy*, 4th May, 1878) to a critic who had correctly but in an objectionable manner called attention to the point, can be regarded as dealing satisfactorily with a question which is fundamental. Much of what Prof. Jevons rather rashly throws out with regard to the possible growth of the theory of induction in Mill's mind might have been spared had he fairly weighed such a passage as the following:—"Neither would it be correct to say that every induction by which we infer any truth, implies the general fact of uniformity *as foreknown*, even in reference to the kind of phenomena concerned. It implies, *either* that this general fact is already known, *or* that we may now know it: as the conclusion, The Duke of Wellington is mortal, drawn from the instances A, B, and C, implies either that we have already concluded all men to be mortal, or that we are now entitled to do so from the same evidence. A vast amount of confusion and paralogism respecting the grounds of induction would be dispelled by keeping in view these simple considerations" (Vol. I. 345 *n.*).

It would require an article fully as long as that of Prof. Jevons, if one were to follow him into the minor points raised. But I should like to say that the absurdity detected by him in the passage quoted from Mill (p. 90, *C.R.)* seems due to some rather arbitrary interpretation of the words 'general law'; that to base scientific induction on the unscientific is exactly the same process which has produced the doctrine of Probabilities,—both are but good sense reduced to rule; and that, despite the awful fate predicted in his last sentences for all who base induction on causation, I should maintain not only that every inductive generalisation involves the assumption of Uniformity, but that the Inverse Doctrine of Probabilities is in precisely the same case.

Robert Adamson.

Necessary Connexion and Inductive Reasoning.—Were the question asked—What it is in the attitude of logicians that seems to me to make the inquiries advanced in this paper indispensable to the progress of logical theory? I should be disposed to return the following answer: The weightier matters of the law are not receiving sufficient attention. While the theory of Evolution, that era-creating discovery of the present century, is being so largely verified in physical science and even in that department of physiology embraced by psychological inquiry, in Logic, the *Scientia Scientiarum* though it has been called, it has not yet been successfully shown to be the law regulating all intellectual processes. It is true, the *à posteriori* school of logicians, guided by this luminous principle, has met with considerable success in prosecuting its inquiries; nevertheless, the opposite school, I venture to assert, still retains hold of enough of the truth to justify its position. The Lualaba of so-called transcendental truth has not, as yet, been identified with the Congo of generalisation from experience. This identification, I need not say, would, at any time, be a consummation devoutly to be wished, but more especially so when, as now, a crisis is impending, and when the extravagant procedure of certain imaginative votaries of science has called forth even from so advanced and fearless an inquirer as Prof. Virchow a warning to keep within the fortified lines of objective truth; and when, therefore, the guiding light of the true *Scientia Scientiarum* seems to be so much needed. What leaves to logicians of the *à priori* school a cause still to uphold is, I believe, the fact that such explanations as their opponents have been able to give of inductive knowing fail to satisfy the implicit convictions of the mind. While, for ages, the domain of reasoning has been largely explored in connexion with deduction and general truths, it is only in modern times that induction and the concrete or the individual have had much attention yielded to them. The differentiating processes, the working-classes of the human intellect, which, in the order of evolution, seem to be prior to the generalising operations, still await their full explication. This incompleteness in the fundamental truths of Logic produces obscuring effects upon the whole science, and causes logicians to be divided in opinion. This, at a period when the civilised world threatens to separate into two hostile camps—authority *versus* free inquiry, is by all real lovers of truth to be deplored.

Truths are usually divided into necessary and contingent—which are here called related terms, contingent being regarded as equivalent to non-necessary, and non-necessary to contingent. Some, however, contend that there is no sufficient reason for dividing truths into necessary and contingent. Any truth, regarded as such, is, they hold, necessarily true. To say that a truth is contingently true is to imply that it is open to doubt. This, however, is not what is meant by a contingent truth. Contingency as applied to truth is not usually understood as a synonym for probability, because many a contingent truth is true beyond all question, is, indeed, necessarily true. For instance, it is as true that a £5 note remains in my purse as long as I can manage to keep it there, as it is true that a whole is greater than its part. What, therefore, is the precise meaning to be attached to the terms necessary and contingent as applied to propositions? By the former, I understand a necessary connexion between one thing and another; by the latter, a contingent connexion. The question here to be discussed, then, is, How is necessary connexion perceived?

Two facts being observed as merely joined together, we have but an indefinite notion, perhaps, of the nature of the union that subsists between them, unless it happens to be previously known to us. This prior knowledge forms the mental *nexus* by means of which we determine the nature of such union, as regards necessity or contingency. How is this *nexus* obtained?[*]

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[*] This application of a mental *nexus* is deduction; the simplest form of which, it appears, is reading out, as we have occasion, what a universal or a general proposition declares as to each case to which it is judged to apply. It rains, some one informs me. Rain constitutes one of the terms of the proposition (implicitly contained in the mind for the most part) "All rain wets," therefore, I conclude, this rain wets, and I never think of going out to ascertain the fact—I feel certain of it.

It is commonly held that deduction involves syllogising. This I fail to perceive. When a chain like Judæa, Samaria, Galilee is given, I perceive that Judæa is mediately joined to Galilee; when I do this I syllogise, but

The only idea of a *nexus* derivable from simple perception is what may be called indefinite or historical. If I perceive, in this way, that A is joined to B, I am made aware of no more than the simple fact of their historical union; and if I thus perceive that A is joined to B invariably in numberless instances, still this adds nothing to my idea of their *nexus*, except that it is a constant and general one, any more than producing ciphers to any extent will yield anything more than a multiplicity of ciphers. Some, however, hold that the notion of necessary connexion is due to nothing else than the constant repetition, without exception, of A + B; that this organises in the mind, by the law of habit, an invincible tendency to think of A + B as inseparable. Now what clearly indicates the erroneousness of this view are the facts that follow. In the first place, the notion of necessary connexion is not enforced by every instance of invariable uniformity of connexion, by the constant rising of the sun, for example. In the second place, uniformity of connexion is not realised wherever the notion of necessary connexion is enforced, for one instance, completely attested, of what is required to prove necessary connexion does as well as a million. At the time alluded to by the poet when he sang—

> Sic fatus, meritos aris mactavit honores,
> Taurum Neptuno, taurum tibi, pulcher Apollo,
> Nigram Hyemi pecudem, Zephyris felicibus albam—

there could have been no belief to any extent in laws of Nature—uniform connexions; yet the feeling of necessary connexion, in single and familiar class instances, was, I feel convinced, as strong then as it is now. In the third place, the notion of necessary connexion is enforced where facilities are afforded for framing a contrary notion, where there are not wanting analogies or models to assist us in imagining the two things as existing apart, and where it is indispensable to ascertain that such a conception of them is excluded. It would be quite possible, for instance, to suppose that oxygen and hydrogen might unite in other proportions than 8 of the former to 1 of the latter to form water, were not the supposition excluded by accurate knowledge.

The fact is, the notion of necessary connexion enters most intimately and largely into the daily experience of every man, woman, and child. Implicitly though it be, we realise the notion every time we perceive that an object rests upon a base, or hangs from a support. When, for instance, we see a statue resting on a pedestal, we are wont to say that the statue depends for support upon the pedestal. But in this and all kindred instances, what do we immediately perceive? Simply that the statue and the pedestal are in contact, the former above, the

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there is here no deduction. These two processes are, indeed, in numberless cases combined, but while deduction, in its simplest form, is determining, by means of a mental *nexus*, that two things are connected, but *not* by a middle link, it cannot involve syllogising, for that, in its elementary form, is perceiving that two things *are* joined by a middle link, or medium of any kind, as A in B in C, therefore, A in C; or A in B, C in B, therefore, A and C co-existing, &c., &c.

latter below. But in this, there is no detection of the fact that the pedestal supports the statue, and before this idea can be acquired there must be a further exertion of mind; there must be a direct perception to the effect that when the pedestal is slipped from under the statue, the latter, unless otherwise sustained, falls to the ground. We have then before the mind the two lines of immediate perception, positive and negative, out of which is evolved the complex perception that the statue depends for support upon the pedestal; in other words, is so connected with the pedestal (first premiss) as not to be able, without the same, to maintain its position (second premiss). Simple perception enables us merely to ascertain that 2 + 3 makes 5, and, again, that in the absence of either 2 or 3 the sum 5 ceases to exist. But when simple perception has done so much it has reached its limit. It is by mediate or inductive perception, by comparing together the above data, that we are enabled to get a knowledge of the necessary connexion which subsists between 2 + 3 and 5. By simple perception we know only that two straight lines *do not* enclose space. It is by inductive perception we know that they *cannot* do the same.

N.B.

Now notice that the reasoning involved in these and kindred instances has, in my opinion, no necessary connexion with generalisation. It is induction in single instances, or in the Category of Difference, which, in the order of evolution, as it seems to me, is, with one exception, prior to the Category of Resemblance,* to which generalisation exclusively belongs; and this mode of reasoning in single instances, which I am inclined to call Singular Induction, seems to be a process taking place in millions of minds that seldom from this foundation attain to universal propositions and laws of Nature, being content simply to reason from the old to the new when the latter presents itself. The burnt child, for example, dreads the fire long before it dreams of launching out of this painful experience into the full stream of universal law. In this sense, I have no doubt, as Macaulay contends, "that the inductive method has been practised ever since the beginning of the world by every human being". Tracing induction, then, farther back than the outlying islands of inference from particulars to particulars, I contend that its mainland consists of single instances, that it has its root in the Category of Difference. According to my thinking, all the operations of the intellect, apart from Conception, the generalising process, are singular. At the root of all thought, especially reasoning, we have nothing but isolated singulars, standing, like so many piers of a bridge, aloof from each other, waiting for the superstructure that is to unite them, singulars which suggest no inference whatever from this instance to that, from these particulars to those. All reasoning from one instance to another involves an effort of conception. When, by Singular Induction, I ascertain that A is necessarily connected with B, and when, by Conception, I note the existence, as mere historical connexions, of other instances of A + B, namely, similar instances, I extend to them the necessary union that, in the case of the first A + B, I have inductively proved. Here, however, observe that it is only when we have, as a foundation, an induction proving necessary connexion that we are fully entitled, in every case, to generalise from this to that. According to this view, then, generalisation is not the first, but the second step in inductive reasoning.

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* It seems to me that all thought moves in two Categories, that of Difference, and that of Resemblance.

Two indispensable elements of all intellectual operations are discrimination and identification.

An object, as presented to sense, is cognised by the intellect as a Whole. This Whole is discriminated, the Whole from its parts, these from each other, and the Whole and its parts from other Wholes. This act of the intellect, which is discriminating judgment, I place in the Category of Difference, although in common with every operation of the intellect, in so far as there must be identification of the manifestation of *this* moment with *that* of the latest, later, late, past manifestation, it is, indeed, in the Category of Resemblance.

Discriminating judgment I call perception, and hold that it is expressed by the Proposition regarded as singular.

Conception, which is the operation to which we owe general notions and common terms, and which, as a judgment, I hold is expressed by the Proposition regarded as general, I place in the Category of Resemblance.

Now, it seems to me, that in logical order, the order of evolution, Conception presupposes Perception. In time, indeed, they may be contemporaneous; nevertheless, there must be two or more percepts to form a concept. A A A, to Perception, single objects become to Conception, because they resemble each other, one whole. Thus, A A A to Perception become to Conception A's.

Perception, Induction, and Syllogising, in the order of evolution, I look upon as being, in the first place, in the Category of Difference, and, therefore, singular.

When Conception operates in conjunction with these operations, they become plural, general, and move also in the Category of Resemblance, the Whole of Extension.

Inductive generalisation carried out to its full extent I would call Universalisation. When, either among co-existences, or among antecedents and consequents, necessary connexion is inductively established, the inquiring mind tends to generalise *ad infinitum*, and express the result in a universal proposition. "Necessity and universality," Hamilton observes, "may be regarded as co-incident. For when a belief is necessary it is *eo ipso* universal, and that a belief is universal is a certain index that it must be necessary. (See Leibnitz *Nouveaux Essais.)*" There is much truth in these words, but they seem to me incorrect in stating that necessity and universality are co-incident. Necessity, by which I mean the belief in necessary connexion, originates in the Category of Difference, that is, among single instances, whereas universality, by which I mean the belief in universal connexion, is in the Category of Resemblance, and the latter, I cannot avoid thinking, presupposes the former, except indeed in so far as the conscious identity of every mental operation with itself from time to time is a fundamental law of mind.

It has been stated above that necessity and contingency, as here used, are related terms. This is shown to be the case in the following manner: If, to adopt J. S. Mill's notation, we compare instances of ABC *abc*, BC *bc* with instances of ABC *abc*, BC *abc*, we must perceive that, in the former example, a kind of connexion is to be detected as existing between A and *a* quite distinct from that found to exist between A and *a* in the latter example. I have elected to call the connexion between A and *a*, in the former instance, necessary, and the ground of universalisation, but, in the latter, non-necessary or contingent, and the ground of limited generalisation only; for I quite fail to understand how these two kinds of connexion can be confounded, or even treated as of no weight. I also fail to perceive how the terms necessary and contingent, so long in vogue for expressing this distinction, can well be changed for the better.

When it is clearly understood that, by induction, we cognise two kinds of connexion, necessary and contingent, it will be all the easier to realise the function fulfilled by the universal proposition in reasoning. That function appears to be to certify that induction, in certain instances, has established necessary connexion so thoroughly that the work need not be repeated when cases coming within the ideal or potential extension of the universal proposition present themselves in reality. Here it is well to observe that any number of inductions proving contingent connexion only do not afford a proposition fulfilling functions similar to the above.

The method by which the universal proposition is reached may be thus set forth: When necessary connexion is proved by induction, the supposed negation, in any case, of such a connexion is felt to be anti-inductive, and, therefore, not to be conceived as true, but the affirmation, in any supposed case, is never felt to be anti-inductive, even when multiplied indefinitely; on the other hand (and the contrast is instructive) when contingent connexion is proved by induction, the supposed negation of such a connexion is not felt to be anti-inductive, and is, therefore, perfectly conceivable. It is quite open for us to imagine that the sun, some time or other, will not show his light, but it is quite out of our power, I say, to conceive that 1 + 1 can, in any part of the universe, present itself to any being endowed with intelligence as making what is known to us as 3. Why? Because such a supposition is anti-inductive.

anti-inductive

It is held by some that the universal proposition guarantees the truth of every proposition that can be deduced from it. Now this guaranteeing force does not reside in the inferentially generalised contents of the universal proposition, but in such of its contents only as are proved by induction to be necessary connexions. If the cases which have undergone inductive scrutiny be A A A, &c., and the ideal cases inferentially generalised from them be *a a a*, &c., the guaranteeing force, as J. S. Mill contends, does not reside in the latter, but solely in the former. There is, however, this important fact to be noticed: the universal proposition serves to measure the amount of guaranteeing force that resides in A A A, &c., and registers the belief that it is *unlimited*, and, therefore, of course, competent for every conceivable case of deduction to which it may be applied.

While maintaining the doctrine of induction herein advanced, I would not have it supposed that I am claiming for elementary induction all that inductive research is usually understood to embrace. If a chemist, in an unexplored region of the globe, were to pick up some new substance, and find, after carefully analysing it—the accuracy of the analysis being confirmed by other chemists—that it was composed of certain elements, this being established by valid induction, he would naturally make a statement, which would be virtually universal, that the substance A consists of such and such elements. This statement, however, would afford no information as to the quantity in which the new substance existed. The naturalist's description of that extinct race of birds called the dodo aims at being a universal statement, as much as his description of the rook tribe which darkens our fields. But such a universal statement, in the one case, conveys no information as to the extinction, or, in the other, as to the superabundance of the birds mentioned. The two lines of investigation here indicated both come under the head of inductive research, but while the one is inductive reasoning, the other is, more properly, statistical observation.

Singular Induction, as it presents itself to my mind, involves a rule of the very highest importance. Macaulay, in his Essay on Bacon, says: "Here is an induction corresponding with Bacon's analysis, and ending in a monstrous absurdity. In what then does this induction differ from the induction which leads us to the conclusion that the presence of the sun is the cause of our having more light by day than by night? The difference, evidently, is not in that part of the process for which Bacon has given precise rules, but in a circumstance for which no precise rule can be given." This latter statement, I confidently submit, is an error, arising from the failure to discover that Induction has its root in single instances. When it is seen that this is the case, the following Rule cannot fail to shine out of the dispersing mist:—*The medium through which the positive and negative premiss of an induction are compared must be really or virtually one.* Tested by this Rule, such reasoning as the following is found to be fallacious, because there is no medium of comparison, as demanded by the Rule: This country prospers, and has protective duties; that country does not prosper, and has no protective duties: therefore, this country prospers because it has protective duties. By the words "virtually one," in the Rule, are meant two media which so nearly resemble each other, like two new sovereigns of the same coinage, that practically there is no difference between them. Thus, if it were possible to find two lads so like in capacity, age, and disposition, as to be proximately identical, and these lads were educated, the one according to the classical, the other to the scientific system, we might conclude, with close approach to accuracy, that any peculiarities manifested by the lads as compared with each other, would be due to the system under which each lad had been educated. But if the lads were so differently constituted as to be opposites to each other, no valid induction could take place.

But how is it that deduction, if, in the order of evolution, it supposes induction, arrived at the purely formal stage of development before the latter? This is to be accounted for by the fact that the problems which were found approachable at the dawn of inquiry were of the kind to demand deductive rather than inductive treatment; the induction that they involved was implicit or spontaneous only, of that sort, for example, which brought forth the axioms and definitions of Euclid. Since universal propositions of the first instance, demanded as a starting point for deduction, were thus acquired, they came, because of their occult origin, to be called self-evident truths, and, in course of time, rational intuitions, *à priori* judgments, and various other names signifying that, as to origin, they are independent of experience, and are not derived, according to the order of evolution, from single instances. As questions involving more inductive treatment came within reach, induction of the statistical order began to be developed, giving rise in course of time to that stage which the *à priori* school describe as incomplete or material induction. But if the doctrine contained in this paper be correct, it follows that there is no reason for limiting universal truths to the sphere of logical and mathematical necessity, and for demanding for them any higher origin than induction. The universal truths of chemistry seem to me to be founded on precisely the same evidence as the universal truths of geometry. A Law of Nature, if proved by induction to be a necessary connexion, stands exactly on the same foundation, as to evidence, as 2 + 3 equals 5. Even the Laws of Identity, Contradiction, and Excluded Middle are, to my thinking, first, simple perceptions giving birth to conceptions; secondly, singular inductions; thirdly, universalisations flowing from the latter source.

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From the brevity I have imposed upon myself, I am conscious that I have not done full justice to the doctrine here advanced; I have, however, recounted its leading features; and after pondering over these for more than a quarter of a century, I venture to think that logicians are called upon to reckon with them before they can confidently affirm what Induction *is* and *is not*. W. GEO. DAVIES.

XI.—NEW BOOKS.

The Philosophy of Reflection. By SHADWORTH H. HODGSON, Hon. LL.D., Edin., Author of *Time and Space, The Theory of Practice*, &c., 2 vols. London: Longmans & Co., 1878. Pp. 441, 312.

"The purpose of these volumes," says Mr. Hodgson in his very striking Preface, "is, first, to lay down the outlines, principles, and method of a system of Metaphysic, basing it upon known facts of consciousness; next, to show that this system necessitates the conception of a Constructive Branch of philosophy, dealing with phenomena which are but very partially accessible to us; and lastly, to combine these two branches (the latter given in merest outline) into a single

System of Philosophy". The present work, following upon its two predecessors, completes for the author a cycle of thought, and he declares, as the result of his whole speculative effort, that "we are at last in possession of a metaphysical system which will not have to be reversed, however much it may in the future be enlarged and differentiated". By Metaphysic or Metaphysical Philosophy he means "that analytic branch of knowledge to which Physic leads, and which in order of study comes after physical knowledge; but while allowing, and even claiming for, it the character of a doctrine of Existence, he means existence that is relative and phenomenal, and thus distinguishes metaphysic from all that has been understood (since Aristotle) under the name of Ontology. The principle he claims to "have established beyond the possibility of reversal is that of Reflection". "Reflection is the foundation of metaphysic, because, being the moment of distinguishing the objective and subjective aspects of phenomena, it gives us our notion of *existence* as well as cognition, and that in the largest sense of the term existence, so that we cannot speak or even frame a notion of anything beyond it." Also, by his distinction of *Nature* and *History* (expounded in MIND, Nos. I.-III., as in the present work), he claims to have drawn a firm line between Science and Philosophy without sacrificing the necessary independence of either; while, in the sketch he attempts of the Constructive Branch of Philosophy, he shows why the ontological questions are not soluble in their old shape, and also in what shape they are conceivably soluble. After otherwise presenting the principal features of his system, Mr. Hodgson, in his Preface (to which attention is now confined), goes on to speak of the sources of his Philosophy. He set himself in these days, after Hegel and Schopenhauer, to carry farther the *critical* strain in Kant's speculations in the manner (as he has since discovered and heartily acknowledges) adopted already in Kant's later years by the Jew Salomon Maimon. The philosophical inspiration came upon him, however, from Coleridge. From Coleridge he has learnt "everything" —notably, the two principles of reflection and of distinction of inseparables, but, most of all, "the intimate union between the intellectual and the emotional elements in human nature". With Coleridge he would maintain that "the emotions, and among them the religious emotions, are as deeply inwoven in the structure and mechanism of consciousness as any feature of sense or reason," carrying us down "into the heart of things, the hidden springs of Being, the inmost nature of the Existent". And, in fine, it seems to him that the two questions of supreme practical importance, in relation to philosophy, at the present time are these :—(1) "Have we or have we not valid reasons for conceiving of ourselves and the actual world in which we live as surrounded by an *unseen*, but in its nature phenomenal, world, of which ours is the seen part and with which it has real but unseen relations?" (2) "Can we treat that unseen world, simply because it is unseen, as if it were not existent?" His affirmative answer to the first is implied in the putting of the second question, and to this his answer, closing a remarkable utterance, in a most impressive No.

On the Theory of Logic: An Essay. By CARVETH READ. London: Kegan Paul, 1878. Pp. 258.

The readers of MIND had a foretaste of this Essay in No. VI., and later on it will receive the critical notice which its importance deserves. It is a fruit of the studies made by the author three or four years ago, when holding a travelling scholarship from the Hibbert Trust.

The Elements of Inductive Logic, designed mainly for the use of Students in the Universities. By THOMAS FOWLER, M.A., Professor of Logic in the University of Oxford. Third Edition, corrected and revised. Oxford: Clarendon Press, 1876. Pp. xxviii., 360.

This new Edition of Prof. Fowler's well-known and useful Manual (appearing only now, though dated 1876), is prefaced by some pointed observations on the "inconsistencies and paradoxes" into which Professor Jevons has fallen in his *Principles of Science,* when treating of the validity of inductive inferences, of the relation of Induction to Deduction, &c. Various alterations and additions have been made throughout the work, rendering it still more effective than hitherto for students' purposes.

BACON'S *Novum Organum,* Edited with Introductions, Notes, &c., by THOMAS FOWLER, M.A., Prof. of Logic in the University of Oxford. Oxford: At the Clarendon Press, 1878. Pp. 619.

A very elaborately annotated edition, replacing the older Clarendon Press edition by Mr Kitchin. The Notes and Introduction together are intended as "a commentary which, besides explaining the difficulties of the work (by no means few or small), should also present Bacon in his relations to the History of Philosophy, Logic, and Science". Prof. Fowler has put into the seventeen distinct sections of his Introduction (amounting in all to 151 pp.) the results of much inquiry, which it may be possible on another occasion to appreciate with due care.

A Candid Examination of Theism. By PHYSICUS. (Vol. IX. of the English and Foreign Philosophical Library.) London: Trübner & Co., 1878. Pp. 197.

An essay of marked ability, that does not belie its title. It examines in six chapters—(1) various Illogical arguments in favour of Theism, (2) the argument from the existence of the Human Mind, (3) the argument from Design, (4) the argument from General Laws, (5) the logical standing of the question of the being of a God, (6) the argument from Metaphysical Teleology; and in a final chapter sums up to a conclusion mainly negative. The essay was written several years ago, before the publication of Mill's posthumous treatise. An Appendix, expository of a fallacy in Locke's use of the argument against the possibility of matter thinking on the ground of its being inconceivable that it should, is followed by four supplementary essays: (1) examining Mr Spencer's Theistical argument with reference to Mr Fiske's

"Cosmic Theism" built upon it; (2) examining Prof. Flint's *Theism*; (3) on the speculative standing of Materialism; (4) on the Final Mystery of Things.

Insanity in Ancient and Modern Life, with chapters on its Prevention. By DANIEL HACK TUKE, M.D. London: Macmillan & Co., 1878. Pp. 226.

The author deals in Part I. with the 'Prevalence of the Causes of Insanity among the Nations of Antiquity,' and enumerating as general causes—intoxication, defective nourishment, inter-marriage, emotional disturbance, and intellectual strain, finds evidence that, if not largely active in primitive races, they became distinctly so among such cultured peoples as Egyptians, Jews, Greeks, and Romans. In Part II., treating of 'Insanity in relation to Modern Life,' he finds, after making every possible deduction, "that there is reason to fear some real increase of occurring insanity" in this country. In Part III. he gives practical advice with a view to 'Self-prevention of Insanity'.

The Final Philosophy, or, System of Perfectible Knowledge issuing from the Harmony of Science and Religion. By CHARLES WOODRUFF SHIELDS, D.D., Professor in Princeton College (New Jersey, U.S.). London: Trübner & Co., 1878. Pp. 609.

The scope of this large treatise will be understood from the following Table of Contents:—

"Introduction—The academic study of Christian Science. Part I. The philosophical parties as to the relations between Science and Religion—Early conflicts between them, or the historical causes of their present disturbed relations—Modern Antagonism between them, or the battle of Infidels and Apologists in each of the sciences, in philosophy, and in civilisation—Modern Indifferentism between them, or the truces of Sciolists and Dogmatists in the sciences, &c.—Modern Eclecticism between them, or the exploits of Religious Eclectics in the sciences, &c.—Modern Scepticism between them, or the surrender of Religious Sceptics in the sciences, &c. Part II. The philosophical theory of the Harmony of Science and Religion—The Umpirage of Philosophy between Science and Religion—The Positive Philosophy, or theory of Science as ignoring Revelation—The Absolute Philosophy, or theory of Omniscience as superseding Revelation—The Final Philosophy, or Theory of Perfectible Science as concurring with Revelation—*Philosophia Ultima:* project of the perfected Sciences and Arts."

Live Questions in Psychology and Metaphysics. By Prof. W. D. WILSON. New York: D. Appleton & Co., 1877. Pp. 164.

Six lectures, selected from the author's Courses on Psychology and Metaphysics with History of Philosophy, as delivered to his classes in Cornell University. The first three are psychological, and treat of Sensation, Consciousness, Volition; the special aim of the author being to sift the various explanations that have been given of these fundamental facts, in the hope of clearing them of some confusion and error. Thus in regard to Sensation he remarks on the absence of any clear definition of its meaning, whether as referring to an act fundamentally distinct from perception, or as implying that along with the latter it goes to make up one complex act. He himself proposes to limit the signification of the term to "any *state* of either of the two lower nerve-centres, which has been recently produced". Perception, on the other hand, is an *act* of the mind, consequent on a sensation reaching the hemispheres of the brain. So in regard to Consciousness he observes that several different and conflicting interpretations have been given to the term, and then proceeds to argue that consciousness is not essential to sensation, either as an element or as a sign. The last three lectures are devoted to the consideration and proposed solution of the three great questions in Metaphysics—the Nature and Origin of Knowledge, the Ground and Extent of Certainty or Absolute Truth, and the Nature and Limits of Real Causes.

L'Imagination. Étude psychologique. Par HENRI JOLY, Professeur à la Faculté des Lettres de Dijon. Paris: Hachette, 1877. Pp. 264.

M. Joly's work, written with delightful facility of style and with fine pyschological insight, contains a very thorough study of the various forms of Imagination in health and disease. Opening with a chapter on the relation between Sensations and the Images formed from them, M. Joly puts forward as explanation of the production of images the general law that each organ struggles to live its own life, to develop and maintain itself, and to continue its normal activity even under unfavourable circumstances. Thus the organs which under external stimulus are concerned in the production of sensations tend in the absence of these conditions to resume the mode of action to which they have become accustomed. The various forms of Imagination are then traced under three heads: (1) Where the images mingle with our ordinary intelligent life without disturbing it or suspending its normal activity (Imagination in health); (2) Where the image does not put an end to the activity of sense or reason, but so interferes with them that their normal order is reversed (Hallucinations, Madness); (3) When the image is so powerful that it veritably suspends in whole or part the exercise of the other mental functions, even of the senses; our mental life is replaced by a secondary mode of existence, dominated throughout by some fixed image or idea (Somnambulism, Ecstasy). These three forms are then treated with considerable detail. Beginning with Somnambulism, M. Joly points out how the remarkable phenomena of intensified sensibility, manifested even in the absence of the normal conditions of experience, may be explained by the action of the image which is dominating the mental life of the somnambulist. The receptivity to impressions in such circumstances is determined to one definite direction, that which harmonises with the ruling idea. Numerous illustrations of this principle are given, and the facts of induced somnambulism or magnetic sleep are brought forward in support of it. In the following chapter (iv.) the author lays down as the conditions of Hallucination, cerebral excitement, suspension of external impressions, and the involuntary exercise of memory and imagination. He shows very clearly how the fixed idea comes to be projected and objectified through the withdrawal of corrective impressions and the enfeeblement of attention and volition. Chapters v. and vi., on Dreams, Unreflective Imitation, and Credulity, are pleasantly written, but contain nothing of importance. Chapter vii. deals fully with the action of the senses as determining the number, quality, and peculiarity of the images, and conversely with the action of images as leading to imitation of observed movements, to the actual experience of imagined sensations and motions, and to the production of states of feeling corresponding to expressive acts. The remaining four chapters contain remarks on imagination as manifested in Natural Expression, in Art, Literature, and Science.

Dei Concetti direttivi di John Stuart Mill nella Logica e nella Psicologia. Nota del Prof. ALESSANDRO PAOLI. Roma: 1877. Pp. 23.

The author divides his essay into two parts. In the first, examining Mill's estimate of the value of names and the nature of general ideas, he maintains that names cannot be held to signify things or to refer directly to physical facts, and further that they cannot be taken as the *data* of Logic. For the purposes of thought a sensation has no other value than what it derives from its relation to other sensations, and the knowledge of any object or physical fact is moulded by the conditions in which it is presented to the mind. The true foundation, therefore, for the rules of Logic is to be found not in names, but in the conceptions which are acquired in the process of scientific thought. When Mill attributes the decline of Logic within the last two centuries to the mistake of comparing two ideas instead of two phenomena in a proposition, he seems to the author to fall himself into a mistake. The older logicians erred, not in seeking to establish a relation between two ideas instead of two phenomena, but in adopting traditional ideas instead of following the advance of thought and recognising that Logic is subject to modification and correction from the progress of knowledge. In the second part of his essay Prof. Paoli discusses Mill's psychological doctrines. He contends that Mill by giving undue regard to phenomena and their laws has landed himself in contradictions, and misconceived the nature of the connexion existing between Logic and Psychology. The belief in the External World, the conceptions of time and space, and knowledge generally, are not to be explained by a mere fusion and union of representations; there must also be the perception of their contiguity, and the exercise of judgment.

Die Ethik David Hume's in ihrer geschichtlichen Stellung. Nebst einem Anhang über die universelle Glückseligkeit als oberstes Moralprincip. Von Dr. GEORG VON GIŻYCKI. Breslau: L. Köhler, 1878. Pp. xvii., 357.

"In this treatise the author seeks to contribute to the due appreciation and true historical understanding of Hume's ethics in Germany. The Introduction deals with the doctrines of the most important English moral philosophers, *viz.*, Bacon, Hobbes, Cudworth, Clarke, Wollaston, Cumberland, Locke, Shaftesbury, Butler, Hutcheson (pp. 1-30). Next follows the exposition with detailed criticism of Hume's ethics (pp. 31-196). In conclusion, a short survey is taken of the chief ethical theorists after Hume, *viz.*, Smith, Hartley, Mackintosh, Bentham, J. S. Mill, and Darwin. The essay appended (pp. 245-357) is only loosely connected with the main treatise. The contents are :—I. Arguments for the Principle of Universal Happiness (1) from the comparative study of morals and moral systems, (2) from the notion of an ultimate scientific principle, (3) from the fundamental constitution of will, (4) from general considerations pertaining to natural philosophy ; II. Denomination of the Principle ; III. The Nature of Happiness ; IV. Why Ethics cannot rest upon the mere feeling of Duty ; V. Vindication of the Principle against misunderstandings and objections."

KANT'S *Prolegomena, &c.* Herausgegeben und historisch erklärt. Von BENNO ERDMANN. Leipzig : Voss, 1878.

"This edition is based on the view that the *Prolegomena* is composed of two parts essentially different in origin and tendency. Kant first intended a mere extract from the *K. d. r. V.* This was in great part completed, when he was moved by the Göttingen criticism to make insertions and additions of a historical and polemical cast. The different parts are separated accordingly in this edition. The Introduction (pp. 128), besides justifying the division, gives an outline of Kant's development from 1780 to '82, with a minute investigation of the relation of the *Prolegg.* to the first edition of the *K. d. r. V.*, resulting in conclusions not a little different from the views hitherto prevalent as to the doctrine of the *Ding-an-sich* and Kant's relation to Hume. (1) It is shown that Kant in 1781 connects his idealism exclusively with the result of the Æsthetic, and employs it in the Dialectic only against the psychological paralogisms and cosmological antinomies. The conclusions of the Analytic are conceived in an empiristic sense only. Owing th[illegible] to the Göttingen criticism and other attacks, there takes place in the *Prolegg.* a change of doctrine, the attempt now being made to combine in a new way the assumption of active things-in-themselves, never doubted by Kant, with the conclusions of the Analytic. (2) It is shown, by a reference to Kant's own acount of his development in the Dorpat MSS., that his veering-round in 1769 was not determined by Hume but by the doctrine of the Antinomy, and that the emancipative influence of Hume was not felt till 1772 (after the letter to Herz). Kant regarded himself therefore not as the opponent but as the follower of Hume."

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Zur Grundlegung der Psychophysik. Kritische Beiträge. Von GEORG ELIAS MÜLLER. Berlin : Grieben, 1878. Pp. 425.

"The first section treats of the psychophysical methods of measurement ; the author, among other things, trying to show that the 'method of mean errors' can give no trustworthy results, and also that the 'method of just observable differences' and the 'method of true and false cases' must be otherwise applied than hitherto. The second section subjects to a detailed consideration and critical sifting the whole series of experiments as yet undertaken in relation to E. H. Weber's law ; and the third is occupied with its interpretation. It is shown, against Hering, Langer, Brentano, Delboeuf, and others, that the approximate validity of Fechner's formula of measurement follows as a more or less probable consequence from the facts of Weber's law ; but that Fechner's psychophysical conception of the formula is far less probable than a physiological interpretation, and cannot be maintained without modification. The fourth section treats of the practical value of Weber's law."

XII.—NEWS.

Mr W. H. S. Monck has been appointed to the Chair of Moral Philosophy in Trinity College, Dublin, in succession to Dr. M'Ivor.

Dr. Alexius Meinong, author of the *Hume-Studien* noticed in the present number, has qualified as *Privatdocent* in the University of Vienna.

The monument to be erected next year to Giordano Bruno at Rome will be supplemented by another national memorial of the philosopher. Professor Fiorentino has been charged by the Minister of Public Instruction with the preparation of a complete edition of his works. The Roman *Opinione*, of May 3rd, contains a description by Prof. Berti of some unedited works of the philosopher existing in autograph MS. in the Library of St. Petersburg.

The rendering of Mr Spencer's 'System of Philosophy' into other languages proceeds apace. Dr E. Cazelles, in France, and Dr B. Vetter, in Germany, have just completed the translations of the *Principles of Biology.* The series of chapters on 'Ceremonial Government,' begun in the January number of the *Fortnightly Review*, will enter into Vol. II. of the *Principles of Sociology*; the old mode of serial issue of parts to subscribers being now discontinued. These chapters are appearing simultaneously also in an American, a French, a German, an Italian, a Hungarian, and a Russian journal.

JOURNAL OF SPECULATIVE PHILOSOPHY. Vol. XII. No. 1.—W. James —'Spencer's Definition of Mind'. Hegel—'Symbolic Art' (transl.). Th. Gray—'The Nation and the Commune'. Rosenkranz—'Pedagogics as a System' (paraph.). G. B. Halstead—'Boole's Logical Method'. Notes and Discussions. Book Notices.

REVUE PHILOSOPHIQUE.—3me Année. No. IV. Ch. Lévêque—'L'Atomisme grec et la Métaphysique'. J. Sully—'Le Pessimisme et la Poésie'. L. Carrau—'Moralistes anglais contemporains : M. H. Sidgwick' (fin). Analyses et comptes-rendus (H. Spencer, *Principes de biologie;* Smiles, *Le Caractère*, &c.) Notices bibliographiques. Rev. des Périodiques. No. V. H. Marion—'John Locke, d'après des documents nouveaux' (H. R. F. Bourne, *Life of John Locke*). H. Spencer—'Études de Sociologie' (IV., V.). P. Regnaud—'Philosophe indienne : La Transmigration'. Analyses et comptes-rendus. Rev. des Périod. No. VI. A. Burdeau—'Le Tragique comme Loi du Monde, d'après Bahnsen'. A. Espinas—'Études nouvelles de Psychologie comparée' (Tissot, *De l'Intelligence et de l'Instinct dans l'homme et dans l'animal*, 1878 ; Vignoli, *Della legge fondamentale della Intelligenza nel regno animale*, 1877). H. Marion—'John Locke, d'après des doc. nouv.' (fin). Observations et Documents—'Le Sens de l'Espace, d'après M. E. de Cyon'. Analyses et comptes-rendus.

LA CRITIQUE PHILOSOPHIQUE.—VIIme Année, Nos. 7-19. C. Renouvier— 'A propos de la peine de mort' (7) ; 'La question de la certitude' (10,13,18) ; 'La psychophysique appreciée d'après la doctrine mathématique' (12) ; 'La caractéristique du crime capitale' (17). F. Pillon—'Quelques mots de M. Littré sur le libre arbitre (8); 'La méthode en biologie—Cuvier, Blainville, Comte' (9); 'Le centenaire de Voltaire et de Rosseau' (9); 'Voltaire et Rosseau jugés par Comte' (13, 14); Frederic Bastiat' (15); 'Hommage a Voltaire' (19). P. Dupuy—'Opposition du catéchisme et de la morale rationelle' (11). Ch. Pellarin—'Voltaire et Bossuet d'aprés la *Revue des deux Mondes*' (19). Bibliographie (A. Mouchot, *La réforme* cartésienne étendue aux diverses branches de Mathèmatiques pures (8); Ch. Secretan, *Discours laïques* (15); B. Perez, *Les trois premières années de l' Enfant* (17)).

LA FILOSOFIA DELLE SCUOLE ITALIANE.—Vol. XVI., Disp. 3. G. Jandelli—'Del Sentimento' (III.). T. Mamiani—'Filosofia della Religione.' A. Martinazzoli—'Del primo conosciuto e del primo inteso.' F. Bertinaria —'Il problema dell' incivilmento'. Carteggio. J. C. Doni—'Del Coraggio, Trattato morale'. N. N.—'Appunti sul Darwinismo'. Bibliografia, &c. Vol. XVII. Disp. 1. La Direzione—'Avvertimento al lettore'. T. Mamiani—'Se il bello sia progressivo'. G. M. Bertini—'Sulla filosofia moderna contemporanea'. M. J. Monrad—'L'idealismo assoluto'. L. Ferri—'I limiti dell' idealismo'. J. C. Doni—'Del coraggio'. L. Ferri—'La filosofia scozzese e il suo ultimo storico, M'Cosh'. Bibliografia, &c. Disp. 2. T. Mamiani—'Le due psicologie', A. Marconi—'La critica nella questione della spiritualità dell' anima umana'. R. Bobba—'La dottrina della libertà secondo Herzen et Spencer in rapporto colla morale'. C. Cantoni—'G. M. Bertini'. Bibliog., &c.

PHILOSOPHISCHE MONATSHEFTE.—Bd. XIV., Heft 3. H. v. Kleist—'Plotin's Kritik des Materialismus'. Recensionen u. Anzeigen (Harms, *Die Philosophie in ihrer Geschichte;* Kapp, *Grundlinien einer Philosophie der Technik;* Deussen, *Die Elemente der Metaphysik;* Barach, *Kleine philos. Schriften;* Pfenninger, *Der Begriff der Strafe;* Espinas, *Des Sociétés animales).* Litteraturbericht (Flint, *Theism,* &c.). Bibliographie, &c. Heft 4. A. Franck—'Ueber E. v. Hartmann's *Phil. des Unbewussten*'. A. Stadler—'Ueber die Ableitung des psychophysischen Gesetzes'. Rec. u. Anzeig. (Gwinner, *Schopenhauer's Leben;* Fontana, *Idea per una filosofia della storia;* Hartmann, *Das Unbewusste vom Standpunkte der Physiologie u. Descendenztheorie;* Hoffmann, *Philosoph. Schriften).* Horwicz, Böhm—'Zur Theorie des Gedächtnisses u. der Erinnerung' (Replik, Duplik). Bibliog. Heft 5. K. Ch. Planck—'Das Causalgesetz in seiner rein logischen u. in seiner realen Form'. L. Weis—'Herder u. die moderne Naturphilosophie'. Rec. u. Anzeigen. (Michelis, *Die Philosophie des Bewusstseins;* Meinong, *Hume-Studien;* Rabus, *Philosophie u. Theologie;* Schramm, *Die Erkennbarkeit Gottes in der Phil. u. in der Religion;* Erdmann, *Grundriss der Gesch. der Phil.* 3te Aufl.) Litteraturbericht. Bibliog.

VIERTELJAHRSCHRIFT FÜR WISSENSCHAFTLICHE PHILOSOPHIE.—Bd. II. Heft 3. W. Windelband—'Ueber den Einfluss des Willens auf das Denken'. H. Vaihinger—'Das Entwickelungsgesetz der Vorstellungen über das Reale' (I.). H. Weissenborn—'Ueber die neueren Ansichten vom Raum u. von den geometrischen Axiomen' (II.). Recensionen. Selbstanzeigen.

ZEITSCHRIFT FÜR PHILOSOPHIE, &C.—Bd. LXXII., Heft 2. F. Bertram—'Die Unsterblichkeitslehre Plato's' (I.). Th. v. Varnbüler—'Das reine Denken'. E. Dreher—'Zum Verständniss der Sinneswahrnehmungen' (III.). M. Schasler—'Zur Geschichte der Ironie'. H. Ulrici—'Psychophysische Fragen u. Bedenken'. K. Kehrbach—'Replik, &c.'. Recensionen. Bibliographie.

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MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

I.—THE MUSCULAR PERCEPTION OF SPACE.

THE intuitive school, Hegel alone excepted, have always held with Sir William Hamilton, that it is "truly an idle problem to attempt imagining the steps by which we may be supposed to have acquired the notion of extension". Yet it is precisely this problem that, during the last few decades, has become the centre of all psychological investigation. In this new direction of thought is involved, to some extent, a change of philosophical base and method. So suggestive are the new facts which have already crowned its researches, that the growing school of Ideal-realism begins to hope for an entire re-statement, if not indeed a partial solution, of the *Wissenschaftslehre* itself. Reacting from the world-bestriding generalisations of the system-builders of the heroic age of German philosophy, and working with a true analytic microcosmic zeal, more to be expected under the influence of Berkeley than of Kant, and none the less truly philosophical because led by specialists, the new method has at least impressed one wholesome moral. Henceforth philosophers will beware of such words as 'simple,' 'immediate,' 'necessary,' 'ultimate,' on the one hand, and 'inconceivable,' 'impossible,' 'unknowable,' on the other, as applied to any forms or products of thought.

Every muscular contraction, with which the most rudimentary known psychic elements of space-perception appear to be somehow connected, consists of a very complex train of material changes. Which of these give rise to the feelings of fatigue and tension, and to the knowledge of the position of our limbs? Some have believed these sensations to be due largely to the skin. Van der Kolk observed that when a mixed nerve sent motor fibres to a muscle, it very often sent sensitive fibres to the overlying skin. Schiff[*] ascribes muscular sense, in part, to the pressure of the belly of the contracted muscle upon the inner tissues of the skin, its stretching and the friction of its moving ends against surrounding softer membranes. Even rheumatic pain, according to Schiff, is seated in morbidly sensitive cutaneous nerves. The movements of the eye are brought to consciousness by nerves surrounding the bulbus. Folding, stretching or pressing the skin near the joints gives rise to sensation of motion in the limb. Leyden[†] observed that if the skin was fully etherised, although difference in weights could be estimated with great accuracy, there were motor disturbances, arising, no doubt, chiefly from a diminished sense of position in the limbs. On the other hand, Bernard[‡] stripped the skin from the limbs of a frog, and found its powers of swimming were not affected for some time, till, owing to the action of the water, the irritability of the muscles and the excitability of the nerves were lost together, while, if the sensitive roots of the sciatic nerve are cut, all the animal's movements become immediately ataxic. Again, it is urged by many physiologists that the Pacinian bodies, lying abundantly as they do about the joints, with the delicate leverage of their capsules, may give us no inaccurate knowledge of the position of our limbs, and even the tension of our muscles. It is quite possible that they contribute to muscular sense, but that they do so only incidentally we may infer from the fact that they are found in the mesentery and along the intercostal nerves where they cannot have this function, and from the general mode of their distribution and the degree of their sensitiveness.

That touch and muscular sense are very intimately connected in every form of animal life, and that the former often acts vicariously for the latter must be fully admitted. The skin is also very sensitive over those parts which admit of the greatest variety and freedom of motion. But that no kind of cutaneous manipulation can give rise to any kind of muscular sensation, almost all observers are agreed. The points where the skin is most sensitive to discrimination of pressure, the forehead, lips, cheeks, &c., are by no means those where muscular sense is most acute. Weber concluded that we could distinguish differences of $\frac{1}{4}$ in weight, and only of $\frac{1}{3}$ in pressure upon the skin, but it may be safely said that, although others have reached quite different results, no one has yet entirely eliminated elements of touch from experiments upon muscular discrimination, whether produced by active or passive movements.

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[*] *Muskel u. Nervenphysiol.* pp. 156, ff.

[†] *Virchow's Archiv*, Bd. 47.

[‡] *Physiol. du Système Nerveux*, I., p. 251.

Some investigators, especially Wundt,* make the chief elements of muscular sense central instead of peripheral, ascribing it to a feeling of innervation. We have a more or less immediate sense of force, it is said, the various degrees and directions of which are distinguished and also associated with experiences of different kinds of movements, and which perhaps, if it be volitional, is directed by an ideal representation of the movement intended, and of which, after it has been executed, we receive more or less accurate tidings from the sense of touch; while, from the time which intervenes between the act of will and the resulting modifications of peripheral sensation, farther details of tension, resistance and rapidity of motion are inferred. The hypothesis of a feeling of innervation, as an ulterior explanation of most, if not all, of the facts of physiological psychology, we regard as marking one of the most important epochs in the history of philosophy. Even as crudely conceived by Schiff, it is a constant function of muscular sense, which nevertheless contains elements quite as specific and distinct as sight itself, and conditioned directly by the state of the muscular fibres. Reserving for the present the discussion of this point, we will only mention here the important experiments of Bernhardt,† who found that we could distinguish weights nearly as well when the muscles of the arm were contracted by electricity as when they were stimulated by the will, and the fact that even the pains of cramp, tenesmus, colic, &c., which have no conscious innervation, are not only felt but are of very distinguishable degrees of violence, as, for instance, in the peculiar case of hemicrania, which long ago led Du Bois-Reymond‡ to assume the existence of sensitive fibres between those of the muscle and irritated by them.

When we remember how constantly sleeping or waking consciousness is modified by the state and action of the visceral organs, and then reflect that the muscles constitute about one-half the bulk of the entire human body, and that, according to the computation of Helmholtz, one-fifth of all its energy, measured by foot-pounds, goes out in muscular work, we may fairly claim, without exhausting the method of exclusion with all its asserted proxies and auxiliaries, that the presumption is strongly in favour of a special muscular sense. More recently, however, its existence has been placed almost beyond doubt by the classic experiments of Carl Sachs.* The anterior sciatic roots of a frog were severed upon one side and, after twenty-four hours for recovery, the animal was made as sensitive as possible by a subcutaneous injection of strychnia. In this way, even the fall of a pin upon the table several feet off, or the voice of the operator, is often sufficient to cause the reflex cramps which are to be used as indices of the irritation of sensitive nerves. Upon the motionless limb, the long sartorius muscle, chosen because its nerves are mostly near the centre, is dissected out upon an isolating plate of glass, till it is connected with the body, which is still further protected from irritation by an envelope of blotting paper, only by its slender nerve-fibre itself. Du Bois-Reymond had shown† that the strongest irritation of a motor root causes little or no effect in an animal similarly prepared. Sachs, however, found that very slight irritations, first by electricity, then by ammonia (which stimulates only muscular fibres), applied at the nerveless ends of his preparation, caused reflex convulsions over the entire body of the frog; which must therefore, in the latter case, be caused by the contraction as such. The physiological proof of the existence of centripetal or sensitive fibres in the muscle itself, at least within the perimysium, could hardly be more complete. The present writer should, however, admit that his attempts to verify this experiment have been extremely unsatisfactory. To his knowledge, indeed, it has never been done.

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* *Physiologische Psychologie*, pp. 288, ff.

† *Archiv für Psychiatrie*, 1872.

‡ *Archiv für Anatomie*, 1874.

The anatomical proof of the existence of special sensitive fibres in muscles was scarcely less conclusive. When motor roots are cut from the spinal cord, which is their nutritive centre, very striking microscopic changes take place in the peripheral portions, which have long been observed, the precise nature of which, however, is a matter of much difference of opinion among anatomists. The fibres are first inflamed, then shrink and shrivel, becoming dull and opaque, till finally, in from four to eight weeks, all distinction of parts is lost in a kind of fatty degeneration. After the effects of such a section, Sachs studied the minute ramifications of the nerve of the same muscle, and found that two, out of about twenty of its fibres, showed no sign of the degeneration which had destroyed all the rest. These he inferred must therefore be derived from the posterior or sensitive roots. The converse experiment was far less satisfactory. This, however, should be expected. The section of the posterior roots must be made below the spinal ganglia, their nutritive centre, and it is almost impossible to make sure that some motor roots of the same muscle have not also been severed.

Archiv für Anatomie, 1874.

†*Untersuchungen über thier. Elek.*, Bd. II., s. 600.

Moreover, it is far harder to follow degenerate among sound fibres than the reverse. The course of the sensitive fibres may even be traced after they have joined the main trunk through its decomposing substance. And, finally, the sensitive roots after section are perhaps kept from decaying by streams of irritation from the intact motor roots, or from the muscle itself, while no such conservative influence can pass from sensitive to motor fibres. Indeed Colastine* has found that there was no degeneration of the peripheral part after severing the olfactory nerve. Sachs finally succeeded in irritating the nerve fibres singly and found that, while most caused the muscular fibres with which they were connected to contract, a few had no such power.

In 1872 Odenius, and a few months later, though independently and by a quite different microscopic method and more minutely, Sachs, traced and described these supposed sensitive fibres and found them the same for all vertebrate striped muscle. They leave the large motor trunk and, instead of ending like its roots very soon after entering the muscle in short, blunt, medullated, dichotomising stems, they soon lose the medullary sheath, and, running over long spaces of interstitial tissue, end, sometimes by turning loosely and irregularly about the outside of a primitive bundle, like a tendril, following its course for some distance, sometimes after countless dendritical branchings by being lost in the meshes of connective tissue or the sarcolemma, while sometimes, after meandering freely between, they appear finally to enter the muscular fibres themselves. These minute pale soft fibres, sometimes given off in considerable numbers, often anastomose, and seem to end in plexuses or even in irregular loops, although Sachs was rarely certain that he had found a veritable fibre-end. That he did so seems highly improbable, for mineral or acid re-agents, as he himself admits, are very apt either to destroy or fail clearly to stain fibres of less than ·001mm. in diameter. Odenius could find no real division of the axis-cylinder, which he believed with Schultze to be itself composed of fibrillæ. After losing the perineurium together with the medulla, the enclosing membrane often cannot be distinguished from its contents, so delicate is it. After their primary and secondary divisions, the course of these fibres is often marked by very peculiar round or biscuit-formed bodies, probably not gangliar in their nature, and not so much interrupting the continuity of the fibre, as springing from its sheath, though many times its diameter. Finally, it should not be forgotten, as an additional proof that these are really sensitive fibres, that they have been found to be most numerous in the muscles of the eye.

***Archiv für Anat. u. Physiol.*, 1875.

This hasty sketch of the present condition of the question of muscular sense brings us to our first enquiry, *viz.*, how do the changes caused in a muscle by motor innervation excite its sensitive fibres? If we wind a string in several spirals about the chest and inhale a full breath, it will slip about four inches for each of the coils which will be drawn slightly nearer each other, while if the string be thoroughly acoustic we can hear the muscular tone with a simple arrangement at the other end. This, like most illustrations, although it conveys a general notion of what takes place, is yet wrong in every detail as an image of the action of a sensitive nerve. The coils by which it encircles the belly of muscular fibres are extremely irregular. Often its course is parallel to them, and sometimes the direction of the coils is reversed, many minute threads passing off more or less diagonally. If these fibres stretch during contraction with the increasing diameter of the fibres they enclose, and if this form of irritation is the immediate datum of the conscious sensation of motion, then either the latter must *infer* one dimension of space from another, the motion of the limb from the swelling of the muscle, or else the inherent difference between the psychic and the neural *aspect*, or "infinitesimal event," involves at bottom that between one dimension of space and another more magnified. The same would also be true of fibres running transversely across a large number of muscular bundles. But the chief change is a diminution of length. In most muscles, owing to their form, this is several times the change in their diameter. Indeed, an ordinary muscle, if isolated, may often shorten three fifths of its length, while the fact that the course of a sensitive nerve is so much more extended after leaving its motor trunk than that of the motor roots themselves, indicates that it can shorten with and like the contractile wave; while if, as would seem to be the case, the motor branches end, not only more briefly, but nearer the centre of the muscle, they would have almost entire immunity from the systematical shortening. Furthermore, it seems possible, from Sachs's isolated irritations, and from the gradual increment of the first stage of ascent in the muscle-curve, that the waves of contraction in the different fibre-bundles do not actually coincide, some fibres beginning to contract a little before and some a little after the instant when the index rises from the abscissa-line on the revolving cylinder. Thus, in case of a nerve in contact with both a pre-punctual and a belated contractile fibre, the intensity of the above mode of irritation would be vastly increased.

These then are the psycho-physical factors of what we shall call the *first* muscular sense. We have seen motion in the terminal organ directly transferred to nervous elements with less change than a sound wave undergoes in being reproduced in the nerves of Corti's arches, or on the recording cylinder of a phonograph. It is from such neural modifications that we get what Bain somewhat inaccurately calls the "sense of range". We may weight or fatigue our hand, or force it into any unnatural position, and yet we can make a dozen marks with a pencil, of any prescribed length, with nearly as much accuracy as in the natural way, so thoroughly is this sense intellectualised or abstracted from other muscular feelings on the one hand, and from the more immediate sensation of shortening fibres on the other. That it is isolated from the former, we regard as one of the most conclusive proofs that innervation is as inadequate to account for the details of muscular sense or feeling, as a father's account of the time and amount of remittances would be as a record of his son's expenses.

Careful measurements with muscles immersed in fluids have shown that they undergo a diminution of volume amounting to about one thousandth of their bulk during contraction. As they are composed of three fourths water which the greatest pressure can reduce only about five hundred-thousandths, it is evident that there must be considerable change in density of their substance. This is easily felt in the hardening of contracted tissue, and varies with the degree of tension or resistance, rather than with the amount of shortening, and may be approximately measured by increased blood-pressure. Any such change would of course be greatly augmented along the crest of each wave of contraction, near the contractile elements; and, in a substance where every tissue must be more or less strained, as the fluid conformed to the law of hydrostatic pressure, those that were softest would suffer greatest change of form. Along the track of the sensitive nerves, apparently attached to their sheath and not interrupting their course but easily slipping over their surface, are the oval or spindle-shaped bodies* above mentioned. They appear enclosed in a hyaline coat, and with a semi-transparent, granular, rather than cellular, content. The finer structure of these pads, although they are very large compared with the fibres they enclose, is entirely unknown. Now may they not be analogous to the tactile corpuscles in structure, though adapted here in the centre of the muscle to respond not so much to contact as to pressure? Sensitiveness to weights when lifted follows the same psychophysical law as weights estimated by cutaneous pressure, with this remarkable coincidence. At the lower end of the former series, up to three hundred grains, Fechner found an increase of discriminative sensibility, which he was entirely unable to explain, except by suggesting an analogy with the immense increase of sensitiveness near the threshold of the touch-scale, known as the phenomena of tickling,* where, up to a certain point, mechanical compression of the terminal substance diminishes sensibility. Farther than this, both alike are inexplicable. If we suppose that, in a free unloaded contraction, a less number of fibres actively shorten than when there is great resistance to be overcome, then the number of these bodies irritated as well as the intensity of their irritation may help our discriminations doubtless in the perception of weight far more than in feelings of range or fatigue. How independent this *second* muscular sense is, appears in the fact that it makes no appreciable difference in the accuracy with which we discriminate two weights, whether we lift them through five or through twenty inches, or, within certain limits, whether we are fresh or fatigued. It is to this sense mainly, that we owe the conception of force, the origin of which empirism could never otherwise explain. If the first muscular sense gives us the data for the perception of empty space, it is this which makes possible the knowledge of matter as occupying space, resistant, acting upon us. Though less endurable, recoverable and independent of the actual presence of objects than the "sense of range," it is perhaps no less susceptible of culture, as we may see in the familiar case of the postman who judges with great accuracy whether a letter weighs more or less than half an ounce.

**Archiv für Anatomie*, 1874, pp. 666-7.

That the above are the respective physical conditions of the two spacial sensations of muscles is made still more probable by the fact that all other known changes in a muscle during contraction either lack the necessary degree of concomitancy, or else the interval between the threshold of sensation and that of pain, in which every kind of perception is lost, is too narrow to be assumed as a basis of such wide ranges of sensation. Heat, for instance, is mainly produced during muscular contraction, but no degree of heat or cold, even though causing the muscles to slightly stretch or shorten,† awakens any sense of motion or resistance. Even the skin which is exposed to far greater ranges of temperature can discriminate differences of only about half a degree. The amount of heat produced by muscles is not a measure of the work they do.‡ It is given off more rapidly with the same amount of rise near the summit than at the base of the muscle-curve.§ Whether, then, all the nervous and other forces causing contraction become heat on their way to external work or not, has no more to do with the sensation of the latter form of motion than with the action of polarised light on the cross-plates. Here, at least, there is no reason to believe we

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* *Psychophysik*, I., pp. 182, ff.

† Samkowy, *Arch. f. d. ges. Physiol.* IX.

‡ Fick, *Beiträge*, § 156.

§ Nawalichin, *Archiv f. d. ges. Physiol.* XIV.

infer molar from a feeling of molecular motion. The same may be said of acids and other products of decomposition, which, by acting on the almost naked axis-cylinder of the assumed sensitive nerves, probably cause the sense of muscular fatigue. This feeling is, no doubt, clearly correlated with that of innervation, but our judgment of motion or weight, instead of conforming to the curve of fatigue, is, up to a certain limit, scarcely affected by it, while, if the sensitive data were the ratio between processes or products of nutrition and retrograde metamorphosis, then again the psychic verdict in any given case would be either infinitely complex or else fluctuating with every change in its physical basis. So, too, of the more painful and undiscriminating muscular feelings, such as excessive fatigue, cramp, &c. Whether these are located in the tendons, as Wundt believes, or depend upon the extent of grey tissue involved in their conduction, as Burkhardt conjectures, or, as many anatomists suppose, are caused by lesion of tissue or of nervous anastomoses in interstitial tissue itself, or by mere excess of the same causes as in normal activity give us true muscular sensations, it is enough to assert their undisputed psychic independence in kind.

Finally, we may add that, while the latest anatomy of muscular fibres suggests the presence of yet more ultimate nervous elements peculiarly adapted to irritation by tension and pressure, our conclusion is not likely to be affected by any solution of such outstanding questions of myophysics as the pre-existence of muscular currents, the presence of a parelectrotonic layer, the number and nature of cross-discs, &c. Gerlach* believes that the fields of Cohnheim, which are light-coloured demarcations of primary bundles of muscular fibrillæ seen by cross-sections, are due to nervous substance which must be conceived as spread over the single sarcous elements as a perfect sheath. Engelmann's† ingenious theory assumes that the anisotropic or doubly refracting substance is the seat of contractile power, and acts by filling itself with fluid to three or four times its former bulk, while he has observed the isotropic substance to shrink and shorten, sometimes as much as 85 per cent., the former growing bright while the latter is growing dark, thus accounting partially for the homogeneous mid-stadium of Merkel. Such changes are far greater than those which take place in the fibre as a whole, and if these are immediately recorded upon sensitive nervous tissue it must be by pressure and tension as before, but vastly augmented, and still furnishing the required extensive and intensive series.

Muscular sense is thus absolutely unique in that the incommensurability between the form of external excitation and subjective sensation found in every other sense does not exist here. It is the motion of the limb, the muscle, the nerve-end itself, which responds by the feeling not of heat, light or sound, but of motion again. This sense is not a mere sign of some unknown *Ding an sich.* Movement, as perceived directly by consciousness, is not even found heterogeneous in quality when perceived indirectly by the special senses of sight and touch. No degree of subjective or objective analysis, though it may simplify and intercalate any number of forms, can change its essential character as motion. This, together with its ento-peripheral nature, gives it a high degree of non-inferential immediacy, *à priori* to the action of any special sense. We can thus strictly say of muscular activity, what Schopenhauer* asserted of our knowledge of the whole body, though in a much stricter sense than his.

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* *Berlin. Klin. Wochenschrift*, No. 45.

† *Mikroskopische Onderzoekingen*, II., 2.

In man the muscular sense is only rudimentary. Its sensitive fibres are best studied in the lower vertebrates. Before and during the development of sight and perhaps touch, which have largely superseded it in man, it must have played a very important part as the chief sensation of animal life. If we assume a nervous system, made of relatively simple arcs and centres, a reflex act would originate with the irritation of a sensitive fibre. This might be very slight; whether or not the fibre itself add to the intensity of the irritation, the ganglia through which it passed would augment the disturbance, and the contraction of the muscles at last, besides being an explosion far greater than can be explained by the amount of irritation, would also, in the lower forms of life, modify, or perhaps even convulse the organic processes of circulation, digestion, &c. Thus we may conceive that the first sensation would rise above its threshold, out of the general reverberation of nervous shocks and pulses, during the muscular crisis of a sensori-motor process. The sense of motion was probably the first as well as the most immediate of all the senses which we have or can directly reproduce.

The experiments of Exner† tend to confirm this view. He found that the direction of a moving point of light could be seen in less than the smallest interval of time that could be distinguished between two successive points of light, in different parts of the retinal field. There is an interval where, while each spark is seen in its place, motion is seen between them, as if one would spring over to the other, and only from the direction of this motion can it be inferred which spark appears first. Moreover, the peripheral retina often sees motion as such with hardly any perception of form or brightness. This is partly cause and partly effect of its feeble localising power. This quality of the eye is more and more pronounced as we descend the scale of animal life, till we reach the faceted eye of insects which see almost nothing but motion; their vision being, as he concludes with Müller, mosaic, while the refractions of the anterior media are so confusing as to deprive them of any adequate perception of form. Certain kinds of motion, he believes, have negative after-images. From this he concludes that the eye, so to speak, tends to see successive impressions as motion where none really exists. Vierordt,* also believing that motion is not a perception but an immediate sensation not implying any inferential knowledge whatever of time and space, enumerates a number of false sensations, persisting against adult insight, which he regards as accidentally uncorrected residua of primitive and pure sense-impressions. If, *e.g.*, we move the little finger to and from the rest, the latter seem to move; if we draw the point of a stick across the back of the hand while the arm is extended and unsupported, the hand itself seems to move against the stick; if we hold the end of the finger motionless against the forehead and shake the head, the finger seems to move, &c. The content of these motor feelings is far different from the developed form of actual or visual space. It is a mere *nicht-zusammenfliessen* of the yet more elementary series of sensations of which they are indissolubly composed, while both rest and punctuality are inferences. It only remains to trace the process by which the child comes to objectively interpret and measure these vague and isolated motor feelings. The author thus postulates a nativism which grants not only that there is nothing spacial in the intellect which was not first in sensation, but also that sensations may themselves be indefinitely compounded of psychic minima, each, however, having the spacial *quale*.

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* *Welt als Wille u. Vorstellung*, I., § 18.

† *Wien. Sitzungsberichte* Bd. LXXII. 3, and *Pflüger's Archiv*, 1875-6.

But it is not merely in these lower and exceptional forms, or even as dependent upon sensible muscular fibres, that motor feelings exist. While out of the sensations of pressure and tension which follow arrested motion, arises perhaps the first rudimentary perception of an external world, developing from general epiperipheral feeling into the special senses with ever-increasing discriminations and extraditions,—reactions also, increasing in complexity, specialty and seriality, have not ceased to respond, in a generic and diffused way, to every changing shade of sensation.

It is probable that there is a constant influx of nervous energy into the muscles.* In reading Hermann's ingenious experiments, it is impossible not to be impressed with the fact that the current he fails to observe may either be so weak or so absorbed by inner work as to elude his most delicate measurements, just as supposed electrical changes in nerve-fibre concurrent with sensation are far beyond the reach of any galvanometric test. If there is a pre-existent constant current in the muscles, it is thus probable that it enters along the highly conductive nerve-tracts, as the electrical organs of fishes are charged from the terminal plates. Again, although it is proven that under certain circumstances nerves may conduct both ways, and that sensitive and motor functions may even be exchanged, there are abundant indications that centripetal and centrifugal functions are never indifferent. In glands, which in many respects are similar to muscles, regular electrical functions have been proven, indicating that stimulation from the nervous centres is constant.† The fact that, of two nerve-muscle preparations, the one with the longer tract of nerve attached dies first, seems best explained by assuming some sort of current from the nerve flowing into and exhausting the muscle below the extremely variable threshold of contractile excitation. The fact of muscular tonicity then is best explained by assuming such a current identical, or more probably concomitant, with electrical changes.

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* '*Zeitsinn*,' 1868, and *Zeitschrift für Biologie*, XII.

This motor innervation, commonly perhaps rising to changes of muscular tension, responds to every variation of sensation. Thus we may explain the great increase of blood-pressure following the irritation of sensitive nerves.‡ How irrepressible such reflexes are, is best seen in the subtle muscle-language of gesture, facial expression, inflexion, &c. How wide a range they have had in the past, we see in imitation and pantomimic speech, and perhaps in the animism of primitive races who imitate the movements and forms of external objects till, by a vivid imaginative transference, inanimate things seem living beings like themselves. How unconscious it may be, we can infer from "planchette," table-tipping, the divining-rod, &c. How minutely and accurately these changes may be perceived even in others, may be seen in the phenomena of mind-reading, and the game of "blindfold seek,"‡ as well as in automatic gestures of all sorts. How impossible absolute immobility is in tonic muscles, may be seen in fixating a star of small magnitude, which we shall find to twinkle more and more obviously because attention has made the muscles of the eye more tense and therefore more tetanic, so that the eyeball swerves as the phases of their vibration interfere and coincide, the ray falling now on, now between, the sensitive elements of the retina. For such a protocol of facts—to which we might add those diffused sensations which give us knowledge of the position of our limbs, the feeling of general muscular vigour or languor, the soothing sense of rest and we know not how many more, very low in the scale of ideal recoverability, of specific qualitative character and localisation—every punctual or non-spacial theory of the soul affords no rational heuristic. Colours and tones would mix, as Fechner well urges, were it unextended. Neither can we call the brain alone the organ of mind. We could rather believe with Professor Bowen in "the omnipresence of the thinking self, one and indivisible in the whole organism".

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* Bain, *Senses and Intellect*, § 25.

† Rosenthal, *Muskeln u. Nerven*, pp. 208. ff.

‡ See Carpenter's *Mesmerism and Spiritualism.*

The Association-philosophy has taught us how indissolubly the terms of a psychical synthesis may be welded together till what is in fact the result of generations of training or experience appears simple and innate. *Abiunt studia in mores* is the formula of all mental growth. It is the very law of intelligence as of nature to conceal or destroy the stages of its own development by consolidating and then relegating to lower centres long processes once conscious, so that the psychologist is confronted not merely by missing links but by what seems an impassable chasm between the phenomena of matter and those of mind. It is the converse of this process, however, which we hold to be of prime importance for the theory of space-perception. As what was once a conscious act may now have become secondary-automatic, or even reflex, so what was once a pronounced muscular effort, semi-convulsive it may be in intensity, is now abridged to a mere form of motor-ideation, the neurosis of which is an innervation perhaps below the threshold of every form or degree of muscular contraction or tension. It seems not impossible, as we shall see later, that this abridgement or repression or elimination of provincial or eccentric co-operation may be carried so far as to be quite independent of the existence of muscles concerned. "The degree of consciousness is inversely proportional to the amount of external diffusion in action."*

In accordance with this are the well-known views of Hughlings Jackson,† that the units or substrata of mind are sensori-motor processes. In reproducing a word in consciousness, *e.g.*, not merely the auditory but the articulating centres are concerned. Not merely are all visual impressions in fixed association with certain ocular motions, but our idea of an object, as a ball, however indistinct, is made up of impressions of surfaces and ocular adjustments. As our ideas of the primary qualities of matter, size and form, are acquired only by motions, motor centres must act if we see or think of material objects, while sensations alone are known only indirectly, and can give us but the secondary properties of matter. Bain asserts that in everything that concerns visible movement and form the muscle-consciousness is the inseparable element, while Lewes concludes that every psychical fact is a product of sense, brain and muscle-work. Wundt lays essential stress upon the fact that attention involves motor activities,* while Ferrier's experiments may be said in a general way to have identified the centres of consciousness and of motion.

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* Ferrier, *Functions of the Brain*, p. 286.

† *Clinical and Physiological Researches in the Nervous System*, I.

How inexpugnable motor elements are from what we are wont to regard as the simplest sensations, almost countless optical experiences, beginning for instance with the Donders-Listing laws, might be cited to show. Helmholtz† argues that the mind neglects and loses in its development every element of sense-perception that it cannot utilise in the knowledge of external objects, especially intensity, which is inversely as perception, so that a pure sensation can only be brought to consciousness by ingenious artificial means. All possible *truth* is practical. To ask whether our conception of chair or table corresponds to the real chair or table apart from the uses to which they may be put, is as utterly meaningless and vain as to inquire whether a musical tone is red or yellow. No other conceivable relation than this between ideas and things can exist. *The unknowable is what I cannot react upon.* The active part of our nature is not only an essential part of cognition itself, but it always has a voice in determining what shall be believed and what rejected.

Thus at length we are brought to our first thesis, which is that, on the basis of such researches as have been enumerated, we are now warranted in assuming that every sensation of motion is itself spacial. The burden of proof indeed now lies with those who assert that, because space is the logical *prius* of motion, it is added to or imposed upon non-spacial sensations as an intelligible form by the mind. It will at least be evident why we claim for the psychologico-genetic aspect of the space-question absolute precedence over the metaphysical. It is true that space by no means implies or necessitates motion, but it is impossible even for an adult analytic mind to conceive of motion without space. The feeling of motion we have shown is the simplest, earliest, most universal, known psychic rudiment of animal life. It is distinguished from every other sensation in being identical with its objective cause or aspect, which is also motion. That motion felt is not the same as motion seen is of course admitted. The external existence of what is imaged on the retina as a moving limb is far more indirect and inferential than the relatively immediate muscular sense of that motion. A state of rest in our own body or in external things, the perception of any defined and static form whatever, and, most of all, the very possibility of unspaciality or punctuality must be subsequently inferred as negative instances from indeterminate extension and movement. These indeed, for an elementary consciousness which rises above its threshold only during crises of bodily activity, would be nothing more or less than abstract transcendental deductions.

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* *Physiol. Psychol.*, p. 793.

† *Physiol. Optik*, pp. 431, 443.

A man moves his foot, and the impression of swelling, shortening fibres is transmitted through five feet of nerve-fibres to a sensitive point in the brain, and there we may suppose the motion of the foot, in an entirely different plane and dimension of space, is inferred. But, if we may imagine any first sensation to arise in some simpler form of animal life, it would be there unrelated and alone in its new, vacant, but conscious horizon. It could have no quality even of pleasure or pain, no reference to anything before or after; for these imply comparison and relation. There would be only a vague area of nerve-muscle substance, feeling its own motion as it moved. Its changes of form would be isomerically identical with its change of state. No matter whether we regard the psychical factor as the centralisation of a more diffused sentiency about the seat of greatest or more heterogeneous changes, or conceive the whole body made a sensorium by a sudden multiplication of disturbance or shocks, extending to its more and its less stable molecules alike. The materialist might prefer to say the molecular registers or "perceives" its molar equivalent of motion, as, *e.g.*, heat registers foot-pounds. We however choose to say that the soul-life, whatever its nature, begins, so far as its origin has yet been traced, in contractile tissue, and that, before discriminating parts, form, limb, position, occupied from unoccupied space, or even an external from an internal world, it has an intuition of undefined extension more absolute and immediate than any other. There is a reciprocity, a direct envisagement, a dialectic indifference, in fact, of organism and intellectual function. If subject is not one with object at some point in primordial space-perception it must remain eternally divorced from it in all the derived unities of external perception or reason. Here alone, though in a spacial respect only, subject, as it were, concurs with, is coincident with, pervades object. They are notyet distinguished or drawn apart, each by its own different cohesions and associations with members of their own series, until, though primarily of the same essential nature, each becomes more and more exclusive of the circumscribed aggregate of activities which makes up the other.* Each may here be conceived as indifferently content and background to the other.

If there is an unbroken succession of nervous changes as a material condition of sensation, no matter how variable the ratio between the two, then spaciality is as inseparable an attribute of motor feelings as of force or matter. This *tertium quid* of equipollency postulated at some point in the history of organic life is indispensable for any psychological theory of the origin of space-perception which establishes at the same time its objective validity.

That there can be no pre-spacial motor feeling, that, just as all knowledge becomes sensation when viewed from a higher standpoint, so muscle-sensation contains an element of cognition of its own bodily substratum, in which certainty may be almost inversely as exactness, we may now assume as evident. It is also plain that the primitive and generic form of sensation just characterised, in which we believe the full solution of the space-question to lie, as it were, pre-formed in embryo, must be evanescent. New sensations would follow arising from new relations. Comparison and repetition would add intensive quality to the mere sense of formless extent. Instead of being only empty forms of self-assertion, experience and elaboration would make them into signs of external activities. As conducting fibres and sentient cells become more distinct and more numerous, psychical life, which we may conceive as beginning in muscular substance, would retire from muscle to nerve and from nerve-fibres to nerve-cells, or rather ascend and unfold in these more special organs. Almost every property possessed by nervous is now found in muscular tissue, and *vice versâ.* Hermann† finds slight electrotonus in muscles, and Tschirjew‡ has proved their independent irritability and also that nerves like muscles are irritable transversely. Both exhibit like phenomena of pulses of negative variation. With two or three exceptions, partly explicable on mechanical grounds, all poisons act on them similarly. Hällstén believes the axis-cylinder to consist of protoplasm capable of a peculiar wave-like motion. Over against these analyses the chief difference, besides that of bulk, appears to be that the active elements of nerves are inclosed in relatively thicker and more resistant substance which fits them to conduct isolated currents of disturbance, while in muscles the interstitial tissue is relatively flexile and conforms to the motion of the active elements, causing contraction.

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*See Spencer's *Psychology*, Vol. I., Part ii., ch. 1. †*Pflüger's Archiv*, VI.
‡ *Archiv für Physiologie*, 1877.

Be this as it may, suppose all sentiency relegated from muscles to the nervous system alone,* and irritability and sensibility distinguished and separated. Even then we might, if disposed, fall back on Brown Séquard's† assumption that, because the length of the twitch of the secondary muscle is increased by overloading the first, muscular sense must be caused by negative variation; or we might with Gubler, who regards recurrent sensibility as a reflex phenomenon, prefer to assume a nervous circuit completed peripherally by intermediate cells, like the grey matter of the spinal marrow diffused and dissociated.‡ A complete neural circulation, however, is by no means the necessary condition of a sensibility independently located in eccentric portions of the human body such as Mr. Lewes supposes. It is of course possible that sensation accompanies the isomeric wave as it runs through the fibres, but it is certainly no less probable that it accompanies the chemical changes thus caused in central cells. If the hypothesis of specific sensibility assumed also uniformity in the centripetal wave and its rate, and if sensation occurs only in cortical cells, then they could of course be distinguished only by local signs minutely differentiated over the three hundred square inches of grey substance upon which their irritations were projected. But it is far less probable that sensation is thus immediately and discriminatively cognisant of molecular neural processes, than that the inseparable motor impulses which attend every form of external stimulation is the immediate cause or object of sensation. Wundt has shown how every form of reflex reaction is strongly inhibited by attention; but that the incipient motor impulse, though repressed, is never wholly eliminated, is no less certain. If the connexions between sensory cells are excited, activities chiefly inhibitory are caused. Inhibition, however, is not the destruction but the storing-up of energy, and is attended not by the discharge but by the increased tension of relatively large and strongly acting motor cells, whose connexions with each other are mainly summative.§

The conclusion which we thus reach harmonises in the main with the deductions of Trendelenburg, though we cannot see more than an analogy between the movement of thought and material motion; and though we can by no means admit that space is primitively inferred as a mere external condition of motion, yet it is certain that all attempts to derive or construe motion into non-motive terms are idle. Movement explains all things. Molar is explained by molecular, known by hypothetical motion, while motion, by which all things are known, must itself be self-known.*

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* Lewes, *Problems of Life and Mind*, 2nd Series, p. 221.

† *Lectures on the Physiol. and Pathol. of the Central Nervous System.*

‡ See Vulpian's *Système Nerveux*, pp. 144, ff.

§ See Wundt, *Mechanik der Nerven*, 2te Abth., s. 133.

In fine, then, we believe it demonstrated, in a sense far more fundamental than that conceived by Bain, that empirism is no more able to explain space than force without muscles, that sensitive elements of contractile tissue constitute the peculiar organ of a space-perception *à priori* to the experience of the special senses, and which it is theirs to elaborate externally and measure each in its own typical way. If this be true, physiological psychology is already able to challenge the dogmatic dualism of the scientific school of metaphysicians, who, assuming with Prof. Tyndall that the essential principles of nature are already discovered, assert two series of events, each of the innumerable terms of which is at the same time indissolubly mated yet absolutely incommensurate with a corresponding term of the other series. This mild and ancient artifice, instead of two, might have given us five worlds. If we assume the touch of two smooth substances to be respectively a right and a left hand spiral motion, and the taste of two to be in the one case an acid, in the other an alkaline reaction, and so on with all the senses, there is a five-fold incommensurability. Instead of one there are five impassable gulfs with no conceivable relation among them save that of empirical association. Even so far as it is a matter of belief, we prefer to plight our allegiance to a program of work yet to be done though it were far more indefinite than it is, rather than to face a blank wall of nescience whereon no other record can be read than that there the limits of individual development or culture were mistakenly and arrogantly asserted to be the limits of possible knowledge. Psychology is no longer content to hold belief in an external world as a mere act of faith or opinion. She postulates an ultimate Monism, and hopes one day to prove a rightful title to the bold nomenclature of the Identity-philosophy. Now, with true Socratic irony, she dares to take for the most part the attitude of ignorance towards an absolute philosophy, and a yet more absolute science. Whether she will disclose the Messianic function and gladden the long travail of thought by new-dispensing the transcendent secret of reason incarnate in organic life, the future alone can tell.

G. STANLEY HALL.

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* *Logische Untersuchungen*, Bk. I., cc. v., vi.

II.—EDUCATION AS A SCIENCE. (IV.)*

I NOW proceed with the review of the Emotions, as motives in Education.

Play of the Emotions of Activity.

Nothing is more frequently prescribed in education than to foster the pupils' own activity, to put them in the way of discovering facts and principles for themselves. This position needs to be carefully surveyed.

There is, in the human system, a certain spontaneity of action, the result of central energy, independent of any feelings that may accompany the exercise. It is great in children; and it marks special individuals, who are said to possess the active temperament. It distinguishes races and nationalities of human beings, and is illustrated in the differences among the animal tribes; it also varies with general bodily vigour. This activity would burst out and discharge itself in some form of exertion, whether useful or useless, even if the result were perfectly indifferent as regards pleasure or pain. We usually endeavour to turn it to account by giving it a profitable direction, instead of letting it run to waste or something worse. It expends itself in a longer or shorter time, but while any portion remains, exertion is not burdensome.

Although the spontaneous flow of activity is best displayed and most intelligible in the department of muscular exercise, it applies also to the senses and the nerves, and comprises mental action as well as bodily. The intellectual strain of attention, of volition, of memory, and of thought, proceeds to a certain length by mere fulness of power, after rest and renovation; and may be counted on to this extent as involving nothing essentially toilsome. Here, too, a good direction is all that is wanted to make a profitable result.

The activity thus assumed as independent of feeling is nevertheless accompanied with feeling, and that feeling is essentially pleasurable: the pleasure being greatest at first. The presence of pleasure is the standing motive to action; and all the natural activity of the system—whether muscular or nervous—brings an effluence of pleasure, until a certain point of depletion is arrived at.

If, further, our activity is employed productively, or in yielding any gratification beyond the mere exercise, this is so much added to the pleasures of action. If, besides the delight of intellectual exercise, we obtain for ourselves the gratification of fresh knowledge, we seem to attain the full pleasure due to the employment of the intellect.

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* Continued from MIND, No. XI.

Much more, however, is meant by the gratification of the self-activity of the learner. That expression points to the acquiring of knowledge, as little as possible by direct communication, and as much as possible by the mind's own exertion in working it out from the raw materials. We are to place the pupil as nearly as may be in the track of the first discoverer, and thus impart the stimulus of invention, with the accompanying outburst of self-gratulation and triumph. This bold fiction is sometimes put forward as one of the regular arts of the teacher; but I should prefer to consider it as an extraordinary device admissible only on peculiar occasions.

It is an obvious defect in teaching to keep continually lecturing pupils, without asking them in turn to reproduce and apply what is said. This is no doubt a sin against the pupil's self-activity, but rather in the manner than in the fact. Listening and imbibing constitute a mode of activity; only it may be overdone in being out of proportion to the other exercises requisite for fixing our knowledge. When these other activities are fairly plied, the pupil may have a certain complacent satisfaction in his or her own efficiency as a learner, and this is a fair and legitimate reward to an apt pupil. It does not assume any independent self-sufficiency; it merely supposes an adequate comprehension and a faithful reproduction of the knowledge communicated. The praise or approbation of the master, and of others interested, is a superadded reward.

Notwithstanding, there still remains, if we could command it, a tenfold power in the feeling of origination, invention, or creation; but as this can hardly ever be actual, the suggestion is to give it in fiction or imagination. Now, it is one of the delicate arts of an accomplished instructor to lay before his pupils a set of facts pointing to a conclusion, and leave them to draw the conclusion for themselves. Exactly to hit the mean between a leap too small to have any merit, and one too wide for the ordinary pupil, is a fine adjustment and a great success. All this, however, belongs to the occasional luxuries, the bon-bons of teaching, and cannot be included under the daily routine.

It is to be borne in mind that although the pride of origination is a motive of extraordinary power, and in some minds surpasses every other motive, and has a great charm even in a fictitious example, yet it is not in all minds the only extraneous motive that may aid the teacher. There is a counter motive of sympathy, affection and admiration for superior wisdom, that operates in the other direction; giving a zest in receiving and imbibing to the letter what is imparted, and jealously restraining any independent exercise of judgment such as would share the credit with the instructor. This tendency is no doubt liable to run into slavishness and to favour the perpetuation of error and the stagnation of the human mind; but a certain measure of it is only becoming the attitude of a learner. It accompanies a proper sense of what is the fact, namely, that the learner *is* a learner and not a teacher or a discoverer, and has to receive a great deal with mere passive acquiescence, before venturing to suggest any improvements. Unreasoning blind faith is indispensable in beginning any art or science; the pupil has to lay up a stock of notions before having any materials for discovery or origination. There is a right moment for relaxing this attitude, and assuming the exercise of independence; but it has scarcely arrived while the schoolmaster is still at work. Even in the higher walks of university teaching, independence is premature, unless in some exceptional minds, and the attempt to proceed upon it, and to invite the free criticism of pupils, does not appear ever to have been very fruitful.*

Play of the Emotions of Fine Art.

This is necessarily a wide subject, but for our purpose a few select points will be enough. The proper and principal end of Art is enjoyment; now whatever is able to contribute on the great scale to our pleasure, is a power over all that we do. The bearings on education are to be seen.

The Art Emotions are seldom looked upon as a mere source of enjoyment. They are apt to be regarded in preference as a moral power, and an aid to education at every point. Nevertheless, we should commence with recognising in them a means of pleasure as such, a pure hedonic factor, in which capacity they are a final end. Their function in intellectual education is the function of all pleasure when not too great, namely, to cheer, refresh, and encourage us in our work.

There are certain general effects of Art that come in well at the very beginning. Such are symmetry, order, rhythm,

* It would lead us too far, although it might not be uninstructive, to reflect upon the evil side of this fondness for giving a new and self-suggested cast to all received knowledge. It introduces change for the mere sake of change and never lets well alone. It multiplies variations of form and phraseology for expressing the same facts, and so renders all subjects more perplexed than they need be; not to speak of controverting what is established, because it is established, and allowing nothing ever to settle. Owing to a dread of the feverish love of change, certain works that have accidentally received an ascendancy, such as the *Elements* of Euclid, are retained notwithstanding their imperfections. The acquiescent multitude of minds regard this as a less evil than letting loose the men of action and revolution to vie with each other in distracting alterations, while there is no judicial power to hold the balance. It is a received maxim in the tactics of legislation that no scheme, however well matured, can pass a popular body without amendment; it is not in collective human nature to accept anything *simpliciter*, without having a finger in the pie.

and simple design and proportion; which are the adjuncts of the school, just as they should be the adjuncts of home life. Proportion, simple design, a certain amount of colour, are the suitable elements of the school interior; to which are added tidiness, neatness, and arrangement, among the pupils themselves; only this must not be worrying and oppressive.

In the exercises suited to infants, Time and Rhythm are largely employed.

Of all the fine arts, the most available, universal and influential is Music. This is perhaps the most unexceptionable as well as the cheapest of human pleasures. It has been seized upon with avidity by the human race in all times; so much so that we wonder how life could ever have been passed without it. In the earlier stages, it was united with Poetry, and the poetical element was of equal, if not of greater power than the musical accompaniment. As the ethical instructors of mankind have always disavowed the pursuit of pleasure as such, and allowed it only as subsidiary to morality and social duty, the question with legislators has been what form of music is best calculated to educe the moral virtues and the nobler characteristics of the mind. It was this view that entered into the speculative social constructions of Plato and Aristotle. Now, undoubtedly the various modes of music operate very differently on the mind; everyone knows the extremes of martial and ecclesiastical music; and fancy can insert many intermediate grades.*

For the moment, a musical strain exerts immense power over the mind, to animate, to encourage, to soothe and to console. But the facts do not bear us out in attributing to it any permanent moral influence; nothing is more fugitive than the excitement of a musical performance. Excepting its value as a substantive contribution to the enjoyment of life, I am not able to affirm that it has any influence on education, whether moral or intellectual. Certainly, if it has any effect in the moral sphere, it has none that I can trace in the sphere of intellect. As a recreative variety in the midst of toil, it deserves every encomium. In those exercises that are half recreative, half educational, as drill and gymnastic, the accompaniment of a band is most stimulating. In the Kindergarten it is well brought in, as the wind-up to the morning's work. But music during ordinary lessons, or any sort of intellectual work, is mere distraction, as everyone knows from the experience of street bands and organs.

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* Plato, in the *Republic*, wishing to train a vigorous and hardy race, interdicted not simply the unfavourable musical strains, but the instruments most adapted to these. He permits only the lyre and the harp, with the panspipe for shepherds attending their flocks; forbidding both the flute and all complicated stringed instruments. Disallowing the lugubrious, passionate, soft, and convivial modes of music, he tolerates none but the Dorian and the Phrygian, suitable to a sober, resolute, courageous frame of mind; to which also the rhythm and movement of the body is to be adapted. (Grote's *Plato*, III. 196.)

Excess in the pleasures of music, like every other excess, is unfavourable to mental culture. But some of the most intellectual men that ever lived have been devotees of music. In the case of Luther it seems to have been incorporated with his whole being; Milton invoked it as an aid in poetic inspiration. These were men whose genius largely involved their emotions. But the musical enthusiasm of Jeremy Bentham could have no bearing on his work, farther than as so much enjoyment.

Poetry is Music and a great deal more. Its bearings are more numerous and complicated. In the ruder stages of music, when it accompanied poetry, the main effects lay in the poetry. The poetic form—the rhythm and the metre—impresses the ear, and is an aid to memory; whence it has been transferred from the proper themes of poetry to very prosaic subjects by way of a mnemonic device. The subject-matter of poetry comprises the stirring narrative, which is an enormous power in human life, and the earliest intellectual stimulus in education.

Play of the Ethical Emotions.

The feelings called Ethical, or Moral, from their very meaning are the support of all good and right conduct. The other emotions may be made to point to this end, but they may also work in the opposite direction.

When the educator describes these in more precise and equivalent phraseology, he generally singles out regard to the pleasure and displeasure of parents and superiors, together with habits or dispositions towards obedience; all which is the result of culture and growth.

Any primitive feelings conspiring towards good conduct must be of the nature of the sympathies or social yearnings; which are called into exercise in definite ways, well known to all students of human nature. By far the most powerful stimulus to acts of goodness towards others, is good conduct on their side; whoever can resist this, is a fit subject for the government of fear and nothing else. The law says 'Do unto others, as ye *would* that they should do unto you'. The lower ground of practice is 'Do unto others as they do unto you'. This is as far as the very young can reach in moral virtue.

It is too much to expect in early years generous and disinterested impulses, unreciprocated. The young have little to call their own; they have no means. Their fortune is their free, unrestrained vivacity, their elation, and their hopes. If they freely give up any part of this, it is in consideration of equivalent benefits. They are susceptible of being worked up to moments of self-renunciation, in which they may commit their future irrevocably, without knowing what they are about. But they cannot be counted on for daily, persistent self-restraint, willingly encountered, unless there be some seen reward, present or in the distance. It takes a good deal to bring any one even up to the point of fair and full reciprocity of services in all things.

The Feelings as appealed to in Discipline.

The survey that has now been made of the sensibilities of the human mind available as motives, prepares for the consideration of Discipline in teaching. The instructor finds that, in school moments and for school purposes, he has to restrain all the unruly impulses, and to overbear the sluggishness of the youthful nature. To succeed in this requirement, many arts are employed, corresponding to the wide compass of sensations and emotions that agitate the human breast.

The question how to maintain discipline among masses of human beings is of very wide application, and is therefore the subject of a great variety of experiments. In the wide field of moral control, it includes a principal function of government, namely, the repression of crime; a department that has lately received much attention. To collect all the lights furnished in each of the spheres where moral control has to be exercised, is to contribute to the illumination of each. There has, undoubtedly, in former times been very great mismanagement in almost every one of the regions of repressive authority; in the state, in the family, and in the school, in all which an excess of human misery is habitually engendered by badness in the manner of exercising control. It is perhaps in the family that the mischief is most widely spread and most baneful.

By degrees we have become aware of various errors that ran through the former methods of discipline, in the several institutions of the state, as well as in the family. We have discovered the evil of working by fear alone, and still more by fear of coarse, painful, and degrading inflictions. We have discovered that occasions of offence can be avoided by a variety of salutary arrangements, such as to check the very disposition to unruly conduct. We consider that a great discovery has been made in regard to punishments, by the enunciation of the maxim that certainty is more important than severity; to which should be added, proportion to the offence. We also consider that by a suitable training, or education, the dispositions that lead to disorder and crime, can be checked in the bud; and that until there has been room for such training to operate, the mind should not be exposed to temptation. We have become accustomed to lay more stress in cultivating the amicable relations of human beings, all which tend to abridge the sphere of injurious conduct on the part of individuals.

The consideration of discipline in Education supposes the relation of a teacher to a class; one man or woman exercising over a body of pupils the authority requisite for the work in hand. Nevertheless, it is not lost time to advert, in the first instance, to the maxims pertaining to authority in general.

Authority, government, power over others is not an end in itself; it is but a means. Farther, its operation is an evil; it seriously abates human happiness. The restraint upon free agency, the infliction of pain on individuals, the setting-up a reign of terror—all this is justified solely by the prevention of evils out of all proportion to the misery that it inflicts. This might seem self-evident; but is not so. The deep-seated malevolence and lust of domination in the human mind makes the necessity of government a pretext for excesses in severity and repression; to which must be added the opportunity of preying upon the substance of the governed.

Mankind have had their eyes gradually opened to this state of things; the philosophy of society now endeavours to formulate the limits to authority, and to the employment of repressive severities. Not only is it restricted to the mildest penalties that will answer its purpose; but its very existence has to be justified in each case.

Authority is not necessary to every teaching relation. A willing pupil coming up to a master to be taught, is not entering into a relationship of authority: it is a mere voluntary compact, terminable at the pleasure of each. There is no more authority over the assemblies of grown men to hear lectures, than over the worshippers at church, or the frequenters of the play. There is nothing but the observance of mutual toleration and forbearance so far as requisite to the common good; if this were grossly violated, there would be an exercise of power either by the collective mass themselves, or by summoning the constable to their aid. No authority is lodged in the lecturer, preacher, or performer, to repress disturbances.

Authority first appears in the family, and is thence transferred with modifications to the school. It is between these two institutions, that the comparison is most suggestive. The parent's authority is associated with sustenance, and has an almost unlimited range; it is tempered by affection, but this depends upon mutuality of pleasure-giving, and supposes a limited number. The teacher's authority has nothing to do with sustenance, his is a duty undertaken for payment; it is subsidiary to the single object of teaching a definite amount of knowledge; it wants the requisites of affection; the numbers are too great, and the mutual concern too restricted; but affection is not wholly excluded, and in certain well-marked cases it may play a part.

On the other hand, the family and the school have some important agreements. They both deal with immature minds, for whom certain kinds of motives are unsuitable. Neither can employ motives that are applicable only to grown men and women; they cannot appeal to consequences in the distant and unknown future. Children do not realise a remote effect, and they fail even to conceive many things that will one day have great power over their conduct. To talk to them about riches, honours, and a good conscience is in vain. A half holiday is more to them than the prospect of becoming head of a business.

The position of immaturity is attended with another peculiarity, namely, that the reasons of a rule cannot always be made apparent. Sometimes they can, if not to the younger, at least to the older children. This is a highly prized aid to obedience in every department of government.

There are many important points of agreement in the exercise of authority in every sphere—the family, the school, the relation of master and servant, ruler and subject whether in the state at large or in any subordinate societies. For example:—

(1.) Restraints should be as few as the situation admits of: the multiplication of grounds of offence is a great evil, and yet exceedingly natural.

(2.) Duties and Offences should be definitely expressed, so as to be clearly understood. This may not always be possible to the full extent; but should be always aimed at.

(3.) Offences should be graduated according to their degree of heinousness. This too needs clearness of discrimination and definite language.

(4.) The application of Punishment is regulated according to certain principles, first clearly pointed out by Bentham.

(5.) Voluntary dispositions are to be trusted as far as they can go.

(6.) By organisation and arrangement, the occasions of disorder are avoided. Quarrels are obviated by not permitting crowds, jostling, and collisions. Dishonesty is checked by want of opportunity; remissness, by the watchful eye and by definite tests of performance.

(7.) The awe and influence of authority is maintained by a certain formality and state. Forms and ritual are adapted to all the operations of law: persons in authority are clothed with dignity and inviolability. The greater the necessity of enforcing obedience, the more stern and imposing is the ritual of authority. The Romans, the greatest law-giving people, were the most stately in their official rites. A small portion of formality should accompany the slightest forms of authority.

(8.) It is understood that authority, with all its appurtenances, exists for the benefits of the governed, and not as a perquisite of the ruler.

(9.) The operation of mere vindictiveness should be curtailed to the uttermost.

(10.) So far as circumstances allow, every one in authority should assume a benign character, seeking the benefit of those under him, using instruction and moral suasion so as to stave off the necessity of force. The effect of this attitude is at its utmost, when its limits are clearly discerned, and never passed.

(11.) The reasons for repression and discipline should, as far as possible, be made intelligible to those concerned; and should be referable solely to the general good. This involves, as a part of national education, a knowledge of the structure of society, as being a regulated reciprocity among all its members, for the good of each and of all.*

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* Whoever occupies a position of authority ought to be familiar with the general principles and conditions of Punishment, as they may be found set forth in the Penal Code of Bentham. The broad, exhaustive view there given will co-operate beneficially with each one's actual experience. I make no apology for presenting a short summary of his principles.

After precisely defining the proper ends of Punishment, Bentham marks the cases unmeet for Punishment. First, where it is *groundless:* that is, where there never has been any real mischief (the other party consenting to what has been done), or where the mischief is overweighed by a benefit of greater value. Second, where it is *inefficacious:* including cases where the the penal provision has not come before the offender's notice, where he is unaware of the consequences of his act, or where he is not a free agent. Third, cases where it is *unprofitable:* that is, when the evil of the punishment exceeds the evil of the offence. (The evils of Punishment, which have to be summed up and set against the good, are (1) coercion or restraint, (2) the uneasiness of apprehension, (3) the actual suffering, (4) the suffering caused to all those that are in sympathy with the person punished.) Fourth, cases where Punishment is *needless:* as when the end can be attained in some cheaper way, as by instruction and persuasion. In this class, Bentham specially includes the offences that consist in disseminating pernicious principles in politics, morality, or religion. These should be met by instruction and argument, and not by the penalties of the law.

Under what he calls the expense or frugality of Punishment, Bentham urges the necessity of presenting to the mind an adequate notion of what a punishment really is. Hence the advantage of punishments that are easily learnt, and remembered, and that appear greater, and not less, than they really are.

Next as to the main point, the *measure* of Punishment. First, it should be such as clearly to outweigh the profit of the offence: including not simply the immediate profit, but every advantage, real or apparent, that

The points of comparison and contrast between the school and family have been noted. The more special distinction of the school, as compared with relations of authority in general, is resolvable into its main object—Instruction, for which the condition that needs to be imposed is Attention and Application of mind, with a view to permanent intellectual and other impressions. To evoke, charm, cajole, compel this attitude, is the first aim in all teaching. The hostile influences to be overcome are such as physical inability and exhaustion, irksomeness in the work, diversions and distractions from other tastes, with the natural rebelliousness of human beings under authority.

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has weighed as an inducement to commit it. Second, the greater the mischief of the offence, the greater is the expense that it is worth while to be at, in the way of punishment. Third, when two offences come into competition, the punishment for the greater should be such as to make the less preferred; thus robbery with violence to the person, is always punished more severely than simple robbery. Fourth, the punishment to be so adjusted, that for every part of the resulting mischief, a motive may be provided to restrain from causing it. Fifth, the punishment should not be greater than is needed for these ends. Sixth, there should be taken into account the circumstances affecting the sensibility of the offenders, so that the same punishment may not operate unequally; as age, sex, wealth, position. Seventh, the punishment needs to be increased in magnitude as it falls short of certainty. Eighth, it must be further increased in magnitude as it falls short in point of proximity: penalties that are uncertain and those that are remote, correspondingly fail to influence the mind. Ninth, when the act indicates a *habit*, the punishment must be increased so as to outweigh the profit of the other offences that the offender may commit with impunity: this is severe, but necessary, as in putting down the coiners of base money. Tenth, when a punishment well fitted in its quality cannot exist in less than a certain quantity, it may be of use to employ it, although a little beyond the measure of the offence: such are the punishments of exile, expulsion from a society, dismissal from office. Eleventh, this may be the case more particularly, when the punishment is a moral lesson. Twelfth, in adjusting the quantum, account is to be taken of the circumstances that render all punishment unprofitable. Thirteenth, if in carrying out these provisions, anything occurs tending to do more harm than the good arising from the punishment, that thing should be omitted.

In regard to the selection of punishments, Bentham lays down a number of tests or conditions whereby they are fitted to comply with the foregoing requirements. First, is the quality of *Variability:* a punishment should have degrees of intensity and duration; this applies to fines, corporal punishment, and imprisonment; also to censure, or ill-name. Second, *Equability*, or equal application under all circumstances: this is not easy to secure; a fixed fine is an unequable punishment. Third, *Commensurability:* that is, punishments should be so adapted to offences, that the offender may clearly conceive the inequality of the suffering attached to crimes of different degrees of heinousness; this property can be grafted on the variable punishments, as imprisonment. Fourth, *Characteristicalness:* this is where something can be found in the punishment, whose idea exactly fits the crime. Bentham dilates upon this topic, in order to discriminate it from the old crude method of an eye for an eye; cases in point occur abundantly both in the family and in the school. Fifth, The arts of proceeding are not the same for a single pupil, and for a class. For the single pupil, individuality may be studied and appealed to; for the class, individualities are not considered. The element of number is an essential feature; carrying with it both obstructions and aids, and demanding a very special manipulation.

It is in dealing with numbers that the teacher stands distinguished from the parent, and allied to the wider authorities of the State; exercising larger control, encountering greater risks, and requiring a more steady hand. With an individual pupil, we need only such motives as are personal to himself; with numbers, we are under the harsh necessity of punishing for example.

Good physical surroundings are known to be half the battle. A spacious and airy building; room for the classes to come together and depart without confusion or collision: these are prime facilities and aids to discipline. Next is organisation, or method and orderly arrangement in all the movements; whereby each pupil is always found in the proper place, and the entire mass comprehended under the master's glance. To this follows the due alternation and remission of work, avoiding fatigue and maintaining the spirits and the energies while the teaching lasts.

After the externals and arrangements come the Methods and Arts of Teaching, considered as imparting lucidity to the explanations, and easing the necessary intellectual labour of comprehension. If to this prime quality can be added extraneous interest or charm, so much the better; but not to be at the expense of clearness, the first condition of getting through the subject.

The personality of the teacher may be in favour of his influence; a likeable exterior, a winning voice and manner, a friendly

Exemplarity: this is connected with the impressiveness of a punishment; all the solemnities accompanying the execution increase this effect. Bentham, however, did not sufficiently consider the evils attending too great publicity, which have led to withdrawing punishments from the gaze of the multitude; it being simply intimated that they have been carried out. Sixth, *Frugality:* or making punishments less costly to the State, as when prisoners are employed productively. Seventh, *Subserviency to Reformation:* by weakening the seductive, and strengthening the preserving motives; as in giving habits of labour to the idle. Eighth, *Efficacy in Disablement:* as in deposition from office. Ninth, *Subserviency to Compensation:* as by pecuniary inflictions. Tenth, *Popularity.* Bentham lays much stress upon the popularity and unpopularity of punishments, whereby the public sympathy may work for or against the law; when a punishment is unpopular, juries are reluctant to convict, and public agitation gets up for remission of sentence. Eleventh, *Simplicity of Description:* under this head, Bentham comments upon the obscure and unintelligible descriptions of the old law, as *capital felony, præmunire.* Twelfth, *Remissibility,* in case of mistake.

expression, when relaxing the sternness of authority. This is the side of allurement or attraction; the other side is the stately, imposing, and dignified bearing, by which the master can impersonate authority and be a standing memento to the evil-disposed of the flock. It is seldom given to one man or woman to display both attitudes in their highest force; but wherever, and to whatever extent, they can be assumed, they constitute a barrier to disaffection and remissness.

Any prominent displays of swagger and self-conceit operate against the teacher's influence, and incite efforts to take him down. It is possible to temper authority with an unassuming demeanour.

Much of course depends upon *tact:* meaning by that a lively and wakeful sense of everything that is going on. Disorder is the sure sequel of the teacher's failure in sight or in hearing; but even with the senses good, there may be absent the watchful employment of them. This is itself a natural incapacity for the work of teaching; just as an orator is sure to fail, if he is slow to discern the signs of the effect that he produces on his audience. A teacher must not merely be sensitive to incipient and marked disorder; he must read the result of his teaching in the pupils' eyes.

That quietness of manner that comes not of feebleness, but of restraint and collectedness, passing easily into energy when required, is a valuable adjunct to discipline. To be fussy and flurried is to infect the class with the same qualities; unfavourable alike to repression and to learning.

Any mistake, miscarriage, or false step, on the part of a teacher, is for the moment fatal to his ascendancy. Such things will happen, and they render undue assumption all the more perilous.

The stress of the teacher's difficulty lies in the heavings of a mass or multitude. The working of human beings collectively, is wholly distinct from their individual action; a new set of forces and influences are generated. One man against a multitude is always in the post of danger. As units in a mass, every individual displays entirely new characters. The anti-social or malevolent passion—the delight in gaining a triumph—which is suppressed in the individual as against a more powerful individual, is re-ignited and inflamed in company with others. Whenever a simultaneous charge is possible, the authority of a single person is as nought in the balance.

It is often said that the teacher should get the collective opinion on his side—should, in short, create a good class-opinion. It is easier to deserve success in this than to command it. The fear is that, till the end of time, the sympathy of numbers will continue to manifest itself against authority in the school. There will be occasions when the infection of the mass is a stronghold of order, as when the majority are bent on attending to the work, and are thwarted by a few disturbers of the peace; or when they have a general sympathy with their teacher, and merely indulge themselves in rare and exceptional outbursts. While a teacher's merits may gain for him this position of advantage, more or less, he is never above the risks of an outbreak, and must be ready for the final resort of repression by discipline or penalties. He may still work by soothing applications, gentle and kindly remonstrance; he may check the spread of disaffection by watchful tactics, and by showing that he has the ringleaders in his eye; but in the end he must punish.

It is this position of constant preparedness for disorder, sometimes in isolated individuals, and sometimes in the mass, that demands an air and manner betokening authority, and carrying with it a certain *hauteur* and distance; the necessity for which is the stronger, as the warring elements are more rife.

The discipline of numbers is impeded by two sorts of pupils: those that have no natural liking for the subject, and those that are too far behind to understand the teaching. In a perfectly-arranged school, both sorts would be excluded from a class.

The foregoing considerations lead up to the final subject—Punishment; in administering which the practice of Education, as well as of other kinds of government, has greatly improved. The general principles of punishment have been already enounced. We have to consider their application to the school. But first a few words on the employment of Reward.

Emulation.—Prizes.—Place-taking.

All these names point to the same fact and the same motive—the desire of surpassing others, of gaining distinction; a motive that has already been weighed. It is the most powerful known stimulant to intellectual application; and where it is in full operation, nothing else is needed. Its defects are (1) it is an anti-social principle, (2) it is apt to be too energetic, (3) it is limited to a small number, (4) it makes a merit of superior natural gifts.

It is a fact that the human intellect has at all times been spurred to its highest exertions, by rivalry, contest, and the ambition of being first. The question is whether a more moderate pitch of excellence, such as befits average faculties, could not be attained without that stimulant. If so, there would be a clear moral gain. Be this as it may, there is no need to bring it forward prematurely, or to press its application at the beginning. In the infant stage, where the endeavour is to draw out the amicable sentiments, it is better kept back. For tasks that are easy and interesting, it is unnecessary. The pupils that possess unusual aptitude, should be incited to modesty rather than to assumption.

The greater prizes and distinctions affect only a very small number. Place-capturing, as Bentham phrases it, affects all more or less, although in the lower end of a class position is of small consequence. Too often the attainments near the bottom are nil. A few contesting eagerly for being first, and the mass phlegmatic, is not a healthy class.

Prizes may be valuable in themselves, and also a token of superiority. Small gifts by parents are useful incitements to lessons; the school contains prizes for distinction that only a small number can reach. The schoolmaster's means of reward is chiefly confined to approbation, or praise, a great and flexible instrument, yet needing delicate manipulation. Some kinds of merit are so palpable as to be described by numerical marks. Next, in point of distinctness, is the fact that a thing is right or wrong, in part or in whole; it is sufficient approbation to pronounce that a question is correctly answered, a passage properly explained. This is the praise that envy cannot assail. Most unsafe are phrases of commendation; much pains is needed to make them both discriminating and just. They need to have a palpable basis in facts. Distinguished merit should not always be attended with pæans; silent recognition is the rule, the exceptions must be such as to extort admiration from the most jealous. The controlling circumstance is the presence of the collective body; the teacher is not speaking for himself alone, but directing the sentiments of a multitude, with which he should never be at variance; his strictly private judgments should be privately conveyed. Bentham's "Scholar-Jury Principle," although not formally recognised in modern methods, is always tacitly at work. The opinion of the school, when at its utmost efficiency, is the united judgment of the head and the members, the master and the mass. Any other state of things is war: although this too may be unavoidable.

Punishment.

The first and readiest, and ever the best, form of Punishment, is Censure, Reprobation, Dispraise, to which are applicable all the maxims above laid down for praise. Definite descriptions of definite failures, without note or comment, are a power to punish. When there are aggravations, such as downright carelessness, a damaging commentary may be added; but in using terms of reprobation, still more strict regard has to be paid to discrimination and justice. The degrees of badness, are sometimes numerical, as by the quantity of lesson missed, and the repetition of inattention; this very definiteness literally stated is more cutting than epithets.

Strong terms of reproof should be sparing, in order to be more effective. Still more sparing ought to be tones of anger. Loss of temper, however excusable, is really a victory to wrong-doers; although for the moment it may strike terror. Unless a man is of fiendish nature throughout, he cannot maintain a consistent course, if he gives way to temper. Indignation under control is a mighty weapon. Yet it is mere impotence to utter threats when the power of execution is known to be wanting. There is nothing worse for authority than to over-vaunt itself; this is the fatal step to the ridiculous.

Punishments must go deeper than words: indeed, the efficacy of blame depends on something else to follow. Bearing in mind what are the evil tendencies to be encountered in school discipline—want of application being the most constant—we may review the different kinds of penalties that have been placed at the disposal of the schoolmaster. The occasional aggravation of disorder and rebelliousness has also to be encountered, but with an eye to the main requisite.

Simple forms of Disgrace have been invented, in the shape of shameful positions, and humiliating isolation. As appealing to the sense of shame, these are powerful with many, but not with all: their power varies with the view taken of them by the collective body, as well as with individual sensitiveness. They answer for smaller offences, but not for the greatest; they may do to begin with, but they rapidly lose power by repetition. It is a rule in punishment to try slight penalties at first; with the better natures, the mere idea of punishment is enough: severity is entirely unnecessary. It is a coarse and blundering system that knows of nothing but the severe and degrading sorts.

Detention from play, or keeping-in after hours, is very galling to the young; and it ought to suffice for even serious offences; especially for riotous and unruly tendencies, for which it has all the merits of "characteristicalness". The excess of activity and aggressiveness is met by withholding the ordinary outlets.

Tasks or impositions are the usual punishment of neglect of lessons, and are also employed for rebelliousness; the pain lies in the intellectual *ennui*, which is severe to those that have no liking for books in any shape. They also possess the irksomeness of confinement and fatigue-drill. They may be superadded to shame, and the combination is a formidable penalty.

With all these various resources ingeniously plied—Emulation, Praise, Censure, Forms of Disgrace, Confinement, Impositions—the necessity for Corporal Punishments should be nearly done away with. In any well-regulated school, where all the motives are carefully graded, through a long series of increasing privations and penalties, there should be no cases but what are sufficiently met. The presence of pupils that are not amenable to such means is a discord and anomaly: and the direct remedy would consist in removing them to some place where the lower natures are grouped together. Inequality of moral tone is as much to be deprecated in a class as inequality of intellectual advancement. There should be Reformatories, or special institutions, for those that cannot be governed like the majority.

Where corporal punishment is kept up, it should be at the far end of the list of penalties; its slightest application should be accounted the worst disgrace, and should be accompanied with stigmatising forms. It should be regarded as a deep injury to the person that inflicts it, and to those that have to witness it—as the height of shame and infamy. It ought not to be repeated with the same pupil: if two or three applications are not enough, removal is the proper course.

The misfortune is that in the National Schools, the worst and most neglected natures have to be introduced: yet they should not brutalise a whole school. Even when children are habituated to blows at home, it does not follow that these are necessary at school; parents are often unskilful, as well as hampered in all their circumstances, and emergencies are pressing; the treatment at school may easily rise above the conduct of the family. In many instances the school will be a welcome haven to the children of troubled homes; and lead to the generous response of good behaviour.

In point of fact, however, the children of wretchedness are not always those that give trouble, nor is it the schools where these are found that are most given to corporal punishments. The schoolmaster's most wayward subjects come often from good families; and they are found in schools of the highest grade. There should be no difficulty in sending away from superior schools all such as could not be disciplined without the degradation of flogging.*

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* Testimonies are adduced from very distinguished men, to the effect that without flogging they would have done nothing. Melancthon, Johnson, Goldsmith, are all quoted for a sentiment of this kind. We must, however, interpret the fact on a wider basis. There was no intermediate course in those days between spoiling and corporal punishment: he that spared the rod hated the child. Many ways can now be found of spurring young and capable minds to application; and corporal punishment would take an inferior position in the mere point of efficiency.

It is not to be held that corporal punishment, to such extent as is permissible, is the severest form of punishment that may be administered in connexion with the school. For mere pain, a whipping would often be

The Discipline of Consequences.

The idea of Rousseau that children, instead of being punished, should be left to the natural consequences of their disobedience, has much plausibility, and is taken up at the present day by educationists. Mr Spencer has dwelt upon it with great emphasis.

One obvious limitation to the principle is that the results may be too serious to be used for discipline: children have to be protected from the consequences of many of their acts.

What is intended is, to free parents and others from the odium of being the authors of pain, and to throw this upon impersonal agencies, towards whom the child can entertain no resentment. But before counting on that result, two things are to be weighed. For one, the child may soon be able to see through the device, and to be aware that after all the pain is brought about by virtue of a well-laid scheme for the purpose: as when the unpunctual child is left behind. The other remark is that, the personifying or anthropomorphic tendency being at its greatest in early years, every natural evil is laid to the door of a person known or unknown. The habit of looking at the laws of nature, in their crushing application, as cold, passionless, purposeless, is a very late and difficult acquirement, one of the triumphs of science or philosophy: we begin by resenting everything that does us harm; and are but too ready to look round for an actual person to bear the brunt of our wrath.

A further difficulty is the want of foresight and foreknowledge in children: they are unable to realise consequences when the evil impulse is upon them. This, of course, decreases by time; and according as the sense of consequences is strengthened, these become more adequate as a check to misconduct. It is then indifferent whether they are natural or ordained.

Among the natural consequences that are relied on as correctives of misbehaviour in the family, are such as these: going with shabby clothes, from having spoilt a new suit; getting no new toys to replace those that are destroyed. The case of one child having to make reparation to another for things destroyed, is more an example of Bentham's "characteristical" punishment.

In school, the discipline of consequences comes in under the arrangements of the school for assigning each one's merit on an impersonal plan; the temper or disposition of the master being nowhere apparent. The regulations being fixed and understood, non-compliance punishes itself.

A. BAIN.

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chosen in preference to the intolerable irksomeness of confinement during play or after hours, and of impositions in the way of drill tasks; while the language of censure may be so cutting as to be far worse than blows. What is maintained is that these other punishments are not so liable to abuse, nor so brutalising to all concerned as bodily inflictions.

III.—INTUITION AND INFERENCE.

II. INFERENCE.

THERE has never been that uncertainty and confusion in the use of the term Inference which has prevailed in the case of its companion, Intuition. There never has been serious dissent from the explanation that an inference is a proposition which is received as true in consequence of the admitted truth of some other proposition. To explore and make evident the psychological processes which constitute the act of inference is, however, a work which has not been thoroughly carried out. As a consequence it happens that the scope of the term has been rather too restricted than too greatly enlarged, and we shall not find error in the way of its improper application so much as in the failure to embrace within it much that there belongs. It will be for us to study here the nature and character of the mental process which makes inference, and see what is concerned in the act of inferring.

Our task is somewhat simplified by our ability at the outset to dismiss peremptorily the whole general division of presentative cognitions from our consideration. Intuitions are not inferences. What is apprehended presentatively, in common parlance, we *know;* we do not *infer* it. In every presentative experience there is indeed a representative element which is not intuition; but in saying that intuition is not inference I do not mean to include that constituent: *so far forth* as a cognition is presentative it is not inferential. We are hence to seek for inferences in the other grand division of cognitions. Inference must be representative cognition of some sort. Is all representative cognition inference, and are the terms convertible?

In answer to this question another may be asked, namely, whether if we were called upon to characterise representative cognition to distinguish it from any other kind, we should not invariably denominate it inferential. We have already noted the difficulties in the way of designating it as intuitional, and there seems to be a naturalness and fitness in terming such knowledge inferential. It behoves us, therefore, to examine the grounds of the appropriateness of such a designation. The matter will be elucidated by the examination of some representative cognition, as that of a picture I saw yesterday. On a recollection of it I have a cognition in my mind of which, as being present, I am conscious. Besides the consciousness of the present cognition, I know that it represents an experience I had yesterday. My mind is, so to speak, carried back to the past experience which I *infer* that I had. By the medium of a present idea the mind is carried back or over to the past sensation. The expression 'mind is carried back' is indeed figurative, but there is no other which indicates better the character of a representation. Representation itself is unanalysable; we only know that this cognition in our minds is a second presentation, a re-presentation. The idea of a picture is not that picture, but is a copy, as it were, of the picture and known to be such. In representing the picture the mind *refers* the present idea to a past sensation which it *infers.* It cannot be said that the one is carried back any more than the other is brought forward; the process is wholly beyond the reach of further analysis, as appears probable. All that can be said is, it is different from immediate beholding.

With the representation of a cognition there will be certain judgments involved. The picture is represented, and with the representation I judge that I saw it, that it existed, &c. These judgments are all inferential; the existence in the past of what we remember is inferred by virtue of our remembering, and, in proportion as our memory of the circumstance is strong or weak, the inference is to us conclusive or inconclusive. We infer that we had certain sensations and infer the existence in the past of objects which afforded such sensations. So plain and distinctive a case of representation as that of representation of a sensation thus carries with it inference as a part of the experience, and, in fact, as constituting the same. If we take away the representative cognition, there is no inferring; if we subduct the inference, either there is no cognition at all or it becomes intuitional.

Now since the instances wherein we find the purest representation reveal inference as an essential part of the cognition, and since all cognition which is not representative is immediate or presentative, from which latter inference is always distinguished, it would seem to be clear that the act of inferring is neither more nor less than representative-cognising. Nothing more is needed to confirm this conclusion than to see whether in the progress of knowledge, in the ratio in which the representative element varies, the character of the knowledge is correspondingly inferential. The earlier parts of this essay and the expositions in two preceding essays, to which I may perhaps be allowed to refer ('Knowledge and Belief,' MIND, No. VII., 'Presentative and Representative Cognition,' MIND, No. X.), tend to make out this latter. The complexity of cognitions depends upon their degree of representativeness; and only in this complexity do we find any call for inference. We cognise through media when we infer, and the less complex and less highly integrated those media, the less inference and reasoning are conspicuous. But the media through which we cognise are representative cognitions in different stages of integration. And given a power of representation and the processes of association of similars and contiguities, psychologists have recently shown how all reasoning is explicable. Both Mr. Bain and Mr. Spencer, as well as the two Mills, have fully developed this branch of mental activity. The processes of association are not other kinds of knowing but are the process of cognition itself, and of the growth, accumulation, and integration of cognitions. From all these considerations, therefore, we are pointed to the inevitable conclusion that inference as a mental process is identical with representative cognition.

For still further confirmation, let us dwell for a moment upon two or three examples of representative cognitions which might at first thought seem to be in no sense inferences. For example, the phrase *I had a father* would appear to be the statement of a fact, and not at all inferential. It is certainly true, the popular mind might say, that I had a father; there is no doubt of it; the expression is moreover an independent statement, not an inference from any other. In response, it should first be said that the truth or falsity, the certainty or doubt, attending a proposition do not depend upon the absence of inference; what we infer may be as true and as certain as what we intuite. I infer that, if all men are mortals, some men are mortals, and this latter conclusion is not more doubtful than my intuition of the light—indeed some would claim the certitude of the latter to be inferior. In the second place, let us see whether, even if there are no explicit premisses for the assertion, there are not some implicit. The cognition expressed by the proposition *I had a father* is a complex one, made up of sundry minor ones. Father expresses the fact of paternity, a general notion derived from various experiences. Certain events are observed to follow certain other events; an association of two individuals of opposite sex, fecundation, conception, and birth follow each other in regular sequence; we generally infer sexual intercourse from the parties living together; fecundation and conception as consequences are wholly matters of inference; so also birth as following therefrom is inferential. Now that these same processes are gone through with in the cases of all human beings is inferred from a universal experience, or one so general and uncontradicted as to warrant the inference that it is universal. Thus that all human beings have fathers is an inference. Moreover, that I am a human being is also an inference derived from a comparison of myself with others I see about me; that I existed yesterday or in any past time is also an inference from my memory. Accordingly we observe that the proposition *I had a father* is a conclusion from a number of implicit premisses, themselves matters of inference. The cognition, therefore, expresses a series of inferences which are involved in its meaning and without which it would have no signification whatever. It is itself an inference from the premisses just set forth. Even so simple a recollection as *I went to London* is made up of inferences. That there is a place called *London* is an inference from common testimony; that I visited a certain town on a particular occasion I infer from a remembrance of a set of occurrences to me; that this town is the one called *London* I infer from testimony likewise.

Again take a cognition which is not expressly a judgment. It will be asked, what possible inference is there about the notion marked by the name *house?* This is the name of a single notion formed by the representation of a number of particular experiences generalised. It cannot be called an inference (some will say), and its presence in the mind is not evidence of a process of inference. Yet I think a little reflection will convince one that this cognition is not attainable without a series of inferences. In the cognition there is a conscious representation of experiences; the general notion is one representative of particular sensations had by me in time past; there are implied judgments at least that I had such sensations, and in this case of the existence of objects causing those sensations; but, as has been already remarked, these latter are inferential judgments. So that in the cognition of a *house*, were we to take away the judgments of past experience and existence, there would be no cognition present at all; and the presence of that cognition involves and requires these inferences. In representing *house*, I infer that I have seen houses and that they existed, and these inferences are a necessary part of the cognition. Here as elsewhere the act of representative cognising is an act of inferring. Equally is this true of other general notions. The word *white* stands for a cognition of some particular white thing which is a representation of or resembles something I have seen; also the co-ordinate cognition that there are numerous objects which agree with this in being white;—both of these cognitions are inferential.

Once more, the comparison of a present object with an absent one, so far as representation is involved, demands inference. All identifications require inference unless the objects identified are all present, and even then inference is not dispensed with, for we are obliged to infer that the objects remain the same from moment to moment. If I say *This is a horse*, there is a degree of inference not difficult to trace. I infer that the image I have in mind of the characteristics of horses had a reality corresponding to the object now before me, agrees with or is like a large number of other objects I have seen and other men have seen; those other objects are not present, and unless I can infer the likeness and that such objects have existence or had it, I am not entitled to say *This is a horse.* Again, therefore, we see that so far as a cognition requires for its explanation the power of representation, it requires inference.

Further illustration may be found in going over carefully the objects of belief, as has been done elsewhere (MIND, No. VII.). We shall in every case see that wherever there is belief, there is inference. In the examples immediately antecedent we have examined some of these cases, and it is hardly necessary to review in detail all cases of belief. They substantially embrace beliefs in existences and events which have been experiences to me or some one else or which may become such experiences. That there have been any existences or events within my experience or within the experience of any one, is inferential (as has been explained); so also is the belief that anything may be expected to come within the experience of any person. But it will be remembered that the acts of representative cognition and belief we discovered to be the same; therefore, we again make an identification of inference and representative cognition.

If the analysis thus far made be correct, there are sundry corollaries which may follow whose importance is considerable, and which when expressed make still clearer the truth of what has been stated in regard to inference. Referring now to the fact previously brought out that representative cognition while distinguishable from presentative does not exist without the latter; that every cognition, every item of knowledge as a product, requires both presentation and representation; that consciousness itself would become unconscious were it not for both,—it will appear that inference is an ultimate and primordial act of mind and involved in all cognition. It is unanalysable, and itself a prime factor in consciousness.

Still further, it appears that the psychological processes of belief and inference are the same and that the attributes of the one may be ascribed to the other. For in a preceding essay (MIND, No. VII.) we learned the correspondence between belief and representative cognition, and observed that what could be attributed to the one of those two could be attributed to the other. We have thus made out three operations to be essentially the same, namely representative cognition, belief, and inference; the one is not present without the others; representative cognition would not be such without belief and inference, belief would not be belief in the absence of representative cognition and inference, inference is not inference at all without representative cognition and belief. But while, therefore, these three terms refer to the same mental operation, they are nevertheless each applicable to somewhat different phases of it. Representative cognition is the generic term applicable to an act of representative apprehension, as such, irrespective of relations and expressions: *House, tree, I had a father, I lived in Boston, Trees have foliage, Men are mortal,* alike mark representative cognitions. When an agreement or disagreement between two distinct cognitions is apprehended, if the resultant cognition is prevailingly representative, it is, when expressed, a belief. The name Belief, when applied to an expressed product of cognition is attached to a proposition; when applied to the cognitive operation itself, it is a judgment, not a single notion. *I lived last week; I shall be living in ten years; London is the largest city of England; Balthasar Gerard assassinated William the Silent; Men are mortal,* are propositions which are distinctively expressive of belief. When instead of one judgment made without dwelling upon its antecedents or consequents, there occur two or more following each other, the mind passing from one to the other with a dependence of the consequent upon the antecedent, we denominate the consequential judgment with reference to the other an Inference: *I lived last week (for I remember sensations occurring to me then); I shall be living in ten years (for men generally live to the age I shall have then reached); London is the largest city of England (as trustworthy authorities have stated); Balthasar Gerard assassinated William the Silent (for the concurrent word of many historians may be relied upon); Men are mortal (since universal experience has been that men have not lived beyond a certain maximum of years)*—all these are inferences from the judgments expressed by the propositions in parentheses, or others similar to them. Every proposition, consequently, which is characteristically representative may be regarded either as the expression of belief or of inference from implicit premisses. The word Inference, however, as characterising a proposition, is usually restricted to a conclusion from premisses found in the discourse in which the proposition occurs, and some of which at least are explicit and the others readily suggested by the context.

If there should arise in the mind of any one at this point a question why the mind cognises a dependence of one cognition upon another, the answer would be that this is explained by the laws of association. There are countless representative cognitions passing through the mind between which no relation of dependence exists; we do not say we infer one from the other. If I were to say, *Men are mortal, therefore dogs have tails*—we should hardly be justified in calling either cognition an inference from the other. I might nevertheless connect these two facts in thought so as to infer one from the other, and though that would not make the inference a valid one, it would still be truly an inference. If I should for any reason come to establish a firm association between these two facts, so that when one was suggested the other should follow it, it would thus be entirely possible for me to infer one from the other. In this way all inferences are created and sustained. If there be a sufficiently strong association by contiguity and similarity, the established connexion will govern the transfer of the mind from one link to another. Representative cognition explains the act of inferring; the laws of association show how particular inferences come to be made and to exist in the manner in which they do.

The elaboration of inferences in the mind takes place most conspicuously and chiefly through the association of similars. Where the mind passes directly from one object to a second, identifying the one with the other, the process is commonly spoken of as Immediate Inference; where it arrives at its conclusion only through the intervention of a third or mediate object, the proceeding is denominated Mediate Inference. Although these distinctions have been very generally made in treatises on logic, I conceive them to be highly objectionable, for all inference, as we have seen, is mediate, that termed immediate being only relatively so—relatively simple and direct as compared with the other. If there be occasion, a distinction may be made and preserved in terms like Simple Inference and Complex Inference, indicating a difference in complexity, but no distinction should be allowed as to the nature of the process. The process of immediate inference is precisely the same as that of mediate inference, and both of them are mediate. In the first case, A suggests its similar B, two are compared directly and an agreement cognised between them. Now agreement means that in so far as two objects agree they are identical, and one may be substituted for the other. Power of substitution is the very essence of agreement, though logicians have not always noted the truth. To Professor Jevons the world is much indebted for the first explicit and complete enunciation of this doctrine (*Substitution of Similars* and *Principles of Science).* If then an agreement be cognised between A and B so that $A = B$, that $B = A$ is not another cognition but a different expression of the same cognition. The mind through the presentative ideas a and b infers the equality of A and B the objects. Thenceforth A and B are associated and one may be substituted for the other, as regards quantity; the cognition instead of being $\boxed{A}$ and $\boxed{B}$ becomes $\boxed{A|B}$ and $\boxed{B|A}$. Thus far so-called Immediate Inference. If now $\boxed{B}$ has been found equal to $\boxed{C}$, instead of our thinking simply $B = C$, the association of B at once arises in the mind and we think $\boxed{A|B} = \boxed{C|C}$ or unite the cognitions in groups like the following, $\boxed{B|C}$ $\boxed{A|B|C}$ $\boxed{A|C}$ $\boxed{C|A}$, &c.; that is $A = B$, $B = C \therefore A = C$. We have, as it were, a double of B compared with C. What is affirmed in quantity of B may be affirmed of its other self its substitute A. The three objects $\boxed{A}$ $\boxed{B}$ and $\boxed{C}$ are brought together in the mind, and a link of connexion is forged between them all; what may be affirmed of A (we are now speaking of quantity) may be affirmed of B and C; what may be affirmed of B may be affirmed of A and C; and what may be affirmed of C may be affirmed of A and B. This is the first step in Mediate Inference. In the two cases, the one of immediate and the other of mediate inference, there is no difference in the kind of the process, but only a difference in the complexity and the length of the movement. When C is finally brought into the mind, its being equal to A is just as immediate an inference as that $A = B$; the mediateness consists in the fact that B was first necessary in order to suggest C—that the mind starting from A went to B and through B brought up C for identification with A. In an extended series of mediate cognitions, the process is one of repeated identifications, and a gathering together and carrying along all that have previously been gained to the next new case; this is more laborious, and when the end of the course has been reached the process appears longer, and, so far as we can determine, is longer than if the inference were an immediate one; but each new inference made in the process is just as much immediate and no more so than the inference $A = B \therefore B = A$. Mediate inference, then, is only a series of immediate inferences, and immediate inferences are mediate or representative cognitions. I *believe* that A (object) $= B$ and $B = A$, or though the ideas $a = b$, $b = a$, I *infer* that $A = B$; this is the simplest step in inference. By the same cognition I infer $B = A$; this is the second step. I then carry along A and B as equals to C, and identify C with A and B simultaneously, by the same cognition pronouncing that $C = B$ and $C = A$; this is the third step. The first of these steps is representative cognition; the second is so-called immediate inference; the third is so-called mediate inference—all of them are but different degrees of representative cognition.

When by so-called mediate inference, which I should prefer to call *discursion*, A is found equal to C, the intervening link B may come to be discarded altogether. This operation is all the time going on in mental experience. Truths are reached by a discursion through other truths and then the middle truth is dropped out of consideration (except perhaps in analysing the steps by which we arrive at the conclusion). Identifications are first made through suggesting media and afterwards are directly apprehended. For instance, experience has established the truth that rattlesnakes are poisonous. I see a certain snake different from any I have ever seen before, but which, from reading and information acquired *vivâ voce,* I esteem to be a rattlesnake. I then infer the reptile before me to be poisonous. There is thus established an association between a reptile of a certain appearance and the attribute poisonous; so that the next time I see a snake of that peculiar appearance I infer it to be poisonous without necessarily first considering that it is a rattlesnake. In truth, what is termed mediate inference occurs only where knowledge is partially integrated. When we are reasoning we are feeling our way to knowledge, or are confirming, establishing, and explicating knowledge; when we have settled the points about which we reason, and have laid out the results, we infer directly and necessarily according to our established associations, and what before has been the conclusion of a discursion in thought passes into the category of uncontradicted and even necessary truth.

Having now shown to the best of my ability the nature, sources, and more rudimental developments of inference, I have done all that is contemplated in this essay. The further exposition of the course and the products of inference embracing the subject of proof, the validity of inferences and the ramifications and classifications of inferential knowledge, so far as the same may be made the subject of distinctive and separate arrangement, belongs to treatises on logic and will not be pursued here. Our examination has gone far enough to illustrate the psychological character and place of Inference, its connexion with, and at the same time its opposition to, Intuition. To show that other minds have seen in somewhat the same channel as my own, regarding inference, I shall take the liberty of quoting (though without stopping to criticise), as bearing upon the subject and the views here maintained thereon, two or three sentences from a noteworthy article in the St. Louis *Journal of Speculative Philosophy*, by C. S. Peirce (Vol. II., pp. 140, 154) and a passage from the treatise on Logic in the *Encyclopædia Britannica*, both of which will be seen to harmonise substantially with this exposition, and may be esteemed corroborative in some degree of the correctness of the positions here taken. Says the former: "All mental action is reducible to the form of valid inference". "The association of ideas consists in this, that a judgment occasions another judgment of which it is the sign. Now this is nothing less nor more than inference." "Inference is only a transition from one cognition to another." The writer in the *Encyclopædia* remarks :—"Logic evolves not laws which govern any one fact of mediate thinking taken singly, but relations between two or more such facts or laws which govern the derivation of one such fact from another or others. That which logic scrutinises is not one fact of thought, but a process constituted by a plurality of such facts. It considers thinking as knowledge or cognition, that is as having objects which are truths, but it assumes and systematises those laws only in virtue of which, one or more facts of knowledge being given, other facts of knowledge may be elicited from them. . . . Psychologically or subjectively considered, discursive thought exhibits no distinctive characteristics beyond those which belong to it as being necessarily mediate or representative. It is always resolvable into a series of judgments. Its peculiarity lies in the relation between the constitutive judgments; it is a relation in which the objective side is the more prominent of the two. We might say, indeed, that the relation subsists not between the acts of judging but between the judgments; not between one mental fact and another but between their several results or products."

Single terms, names, and words are not usually held as standing for inferences; that all the cognitions indicated by these symbols involve inferential cognition, however, may be repeated. The proper sphere of inference is judgment, and, as the writer in the last quotation seems to imply, not single judgment, but the relations between judgments. A proposition then is the characteristic expression of an inference. On the other hand single terms rather than propositions are the most appropriate expressions of intuitions. Probably the words indicating the purest intuitions are the exclamations as *ah! oh!* The personal pronouns as *I*, *thou*, *he*, and the demonstratives *this*, *that* frequently designate primarily an intuition; concrete names applied to an individual present, or a present experience, as *John*, *house*, *fire*, *cold*, are symbols of intuition. General names as such are marks of cognitions characteristically inferential; abstract names do not stand for intuitions at all. It is hardly proper to call any proposition intuitive. Even so simple and apparently immediate cognition as that expressed by *A is A* is as much inferential as intuitive—indeed, more so, for it depends for its validity upon the prior proposition *A is*. *A is A* is an inference meaning, *So long as A is, A is A*. The thought *I exist* is intuition mixed with inference; for existence is general in its meaning and hence representative. I only intuite that *I am I* by the prior cognition *I was I* at various preceding moments; while, as a proposition, *I exist* stands for a presentative mixed with a representative cognition. Of course propositions imply intuition, but if we call them intuitions we are led into difficulty by the necessity of using the very same propositions as inferences. If we say *A is A*, standing for an intuitional cognition, is itself properly to be called an intuition, or that its prevailing character in general is intuition, we are met by such cases of its use as the one above taken, *A is A, for A is.* Evidently in this latter use *A is A* is an inference and inferential. Similarly every proposition may point primarily either to an intuitive or an inferential act of the mind, according to circumstances. Inasmuch, however, as propositions for the most part convey general knowledge and are highly representative, if they were as a class to be characterised by either of the two terms before us, the adjective *inferential* would be the more fitting. Most propositions can at once be shown to be inferences from implicit premisses. Language derives its value from the fact that it is general and common. Its office is to preserve and communicate, but this requires that it shall stand for representative cognitions. The meaning of a word is its general connotation, its representative character. A pure intuition cannot be expressed at all by language, any more than it can be found alone in mental experience.

We are now prepared for a brief summary to fix more clearly in mind the results attained in this essay.

First. Intuition is a cognitive act of immediate beholding, inference is a cognitive act of mediate beholding. Intuition corresponds with presentative and inference with representative cognition; the two are antithetical and mutually exclusive.

Second. Both intuition and inference are present in every act of cognition, varying as presentative and representative cognitions vary. No cognition is purely intuitive or inferential, but the prevailing character may be one or the other; a cognition may be relatively intuitive or relatively inferential. If either intuition or inference were wholly absent there would be no cognition at all but an absence of consciousness. Both are ultimate and unanalysable mental operations.

Third. Inferring and believing are the same cognitive act, both being phases of representative cognition. In believing, the mind dwells upon two cognitions seen to agree or differ, without considering attentively the relations of those two cognitions to anything save each other. In inferring, the mind connects two pairs of cognitions and cognises a relation of agreement in difference between them. Every representative cognition may be viewed as a belief or as an inference; every belief may be regarded as an inference and every inference as a belief.

Fourth. The formation and establishment of particular inferences as permanent products is the work of association, according to the laws of contiguity and similarity, the latter being the chief and most conspicuous process. The simplest and most direct inference lies in the cognition of identity or similarity between two objects, the essence of the agreement being the cognition of interchangeability between the two, so that one may be substituted for the other. As other associations are joined this process is repeated, and the mind advances discursively from one cognition to the other, carrying over to the conclusion what is in the premisses. As associations become more firmly established and many connexions are made, intermediate links are dropped and inference direct assumes the place of discursive inference: the latter is characteristic of the acquiring, confirming, and arranging of knowledge; the former occurs as a perfected result of the associating processes.

Fifth. Intuition is more characteristically expressed by single terms, inferences by propositions; no language, however, stands exclusively for either, but all language indicates both, since in every cognition the two are inextricably involved. In discourse, nevertheless, those propositions are commonly called inferences which are connected in dependence upon other propositions, the whole indicating a passage of the mind from one to the other in the relation of dependent and principal; with such the science of logic deals.

Dugald Stewart in a most remarkable and instructive passage (*Philosophy of the Human Mind*, Part II., ch. 2,) has, I think, approached more nearly than any other before his time (save perhaps Locke), and more nearly than the most who have since lived and written, to the true solution of the problems concerning the nature and connexion of the intuitive and ratiocinative powers of the mind. Stewart saw the intimate connexion of intuition and inference, though from their constant presence together he erroneously considered that there was no radical difference between them, and though he did not clearly and distinctly apprehend in their details the complete operation of the laws of association and of the representative powers in the production of all varieties of reasoning.

DANIEL GREENLEAF THOMPSON.

IV.—TRANSCENDENTALISM.

THAT the pure empiricism still in fashion among scientific philosophers leads naturally to scepticism is a fact which has been familiar to certain schools of thought ever since Hume presented it to the world stripped of its plausibilities. It is hardly to be believed that so subtle a thinker did not himself perceive the ultimate consequences of his reasoning. He must have been perfectly aware that on his system a philosophy of science was impossible; nevertheless, his "Essay on Miracles" and occasional announcements, such as that with which he ends his *Inquiry concerning Human Understanding*, appear to have quite convinced natural philosophers that his scepticism merely undermined religion, a result which to most of them was a cause of very moderate uneasiness. If, however, they ignored, and still ignore, the wider reach of that engine of destruction, it has not been for want of telling.

Hume himself makes no effort to conceal it, and the sneer with which he informs the students of science that theirs is the only kind of knowledge worth pursuing, is scarcely less obvious than that with which he tells the theologian that the most solid foundations of religion are "faith" and "divine revelation". But Hume's own view of his position is not the only, nor even the main, evidence for the sceptical nature of the conclusions to which his theories necessarily lead. On that scepticism, as we have been informed with sufficient iteration, is founded the whole imposing structure of modern German philosophy; and modern German philosophy, whatever be its value, is not a phenomenon which easily escapes notice. If it gives little light it is not because it is hidden under a bushel. In all probability, however, its very magnitude has prevented it from materially influencing the course of scientific philosophy in this country; and I believe I may almost say from permanently influencing scientific philosophy even in Germany. A man may be forgiven if, before seriously attempting to master so huge a mass of metaphysics, composed of several inconsistent systems, difficult of comprehension from their essential natures, still more difficult from the extraordinary jargon under which the ingenuity of man has concealed their import—he may be forgiven, I say, if he pauses and considers whether the time may not be better spent in reading something he is more likely to understand. It is, however, unfortunate that this pardonable, and even laudable, caution should have prevented so many people from trying to comprehend the exact difficulty which Kant and Kant's successors saw in the empiricism of Hume, and the extremely ingenious method which they adopted in order to avoid it; for when these are understood it becomes at once plain that the difficulty is a real one, and that the solution offered of it, at any rate, deserves consideration.

The relation in which Kant stands to Hume is not a topic which it is necessary for me to discuss; nor, if it were, could I, it need hardly be said, add anything to what Mr. Green and Mr. Caird, not to mention previous commentators, have already written on the subject. My purpose is to examine the answer which, as I suppose, a transcendentalist would make to the sceptic on the two points of *causation* and the *existence of an independent world*.

Now the usual way in which the transcendental problem is put is, "How is knowledge possible?" and, taking transcendentalism as an answer to Hume, this, the usual way, is also the most natural, because it was Hume's theory of the *origin* of knowledge which led necessarily to scepticism. As, however, the sceptic need not put forward any view of the origin of knowledge, the question should rather be stated, How much of what *pretends* to be knowledge must we accept as such, and why? My business, therefore, is to extract from the answer which the transcendentalist gives to the first inquiry, an answer which shall, if possible, satisfy the second; and for this purpose it is necessary to make a slight, though only a slight, change in the usual mode of stating his doctrine.

In a former article in MIND (No. IX.) I insisted on the obvious truth that every tenable system of knowledge must consist partly of premisses which require no proof, and partly of inferences which are legitimately drawn from these. What, then, on the transcendental theory, are our premisses, and by what method do we derive from them the required conclusion?

If we were simply to glance at transcendental literature, and seize on the first apparent answers to the questions, we should be disposed to think that the philosophers of this school assume to start with the truth of a large part of what is commonly called science—the very thing which, according to my view of the subject, it is the business of philosophy to prove. "Respecting pure mathematical and pure natural science," says Kant (*Critique*, p. 13, Tr.), "as they certainly do exist, it may with propriety be asked *how* they are possible; for that they must be possible is shown by the fact of their really existing." "The question, How is knowledge possible? is not," says Mr. Green (*Contemp. Review*, Dec. 1877), "to be confused with the question upon which metaphysicians are sometimes supposed to waste their time, Is knowledge possible? . . . Metaphysic is no superfluous labour. It is no more superfluous, indeed, than is any theory of a process which without theory we already perform." Passages of this sort would almost lead one to conclude that the business of transcendental speculation was not to justify beliefs, but to account for their existence: to tell us how we do a thing, not whether we ought to do it: a view by which, apparently, philosophy is regarded as dealing with the laws of thought much as physiology deals with the laws of digestion. If this were so, transcendentalism might be an important and useful department of science, but it could have nothing to do with the subject of this essay. It would answer no doubt, it would solve no difficulty. But, in truth, the language often used by Kant and echoed above by Mr. Green, if not incorrect, is certainly misleading. Transcendentalism *is* philosophical, in the sense in which I have ventured to use the term; it *does* attempt to establish a creed, and, therefore, of necessity it indicates the nature of our premisses and the manner in which the subordinate beliefs may be legitimately derived from them.

On the first point its statements are not, indeed, explicit and categorical; but this is simply because, for historical reasons, the philosophic problem has not been presented to it exactly in the shape which makes such statements necessary. Nevertheless, all I suppose that a transcendentalist would postulate in the first instance, or rather all that each man who studies his system is required to postulate, is that he knows, and is certain of, *something;* he is conscious, for example, or may be conscious, that he perceives a coloured object, or a particular taste; in other words, he gets some knowledge, small or great, by *experience.*

This very moderate concession, then, being granted, as it must be granted, by the sceptic, the next question that arises is, How can any knowledge worth speaking of be inferred from such premisses? It is in the answer to this that such force and originality as there may be in transcendentalism is really to be found; and it is here that the full meaning of the question which is placed at the head of that philosophy becomes manifest. "You allow," we may suppose a transcendentalist to say, "You allow that experience is possible; you allow that some knowledge, though it may only be of the facts of immediate perception, can be obtained by that channel. I therefore ask you how that experience is possible—in what it essentially consists: and whatever fact or principle I can show to be involved in that experience—whatever I can prove must be, if that experience is to be—of that you must, in common consistency, grant the reality." A principle so proved is said to be "transcendentally deduced," and it is the validity of that deduction in the cases of causation and the existence of an independent world that we are now more particularly to examine.

The whole value, then, of the transcendental philosophy, so far as the questions raised in this essay are concerned, must depend on its being able to show that the trustworthiness of these far-reaching scientific postulates is involved in those simple experiences which everybody must allow to be valid. If it cannot prove this, it may still be a valuable contribution to a possible philosophy; it may still show by its searching analysis all that is implied in the existence of nature, as we ordinarily understand nature, and of the sciences of nature as we are taught to accept them: but more than this it cannot do; it cannot show either that such a nature exists, or that our accounts of it are accurate; it cannot, in other words, supply us with a philosophy adequate to our necessities.

Before going on to consider the general value of this method, or the success of its application in particular instances, it may be well to give some examples of its reasonings by which its precise character may be more clearly understood. Here, for instance, is one taken from Kant's proof of the principle of substance (*Critique*, pp. 140-141, Tr.) :—

> "Change cannot be perceived by us except in substances, and origin or extinction in an absolute sense, that does not concern merely a determination of the permanent, cannot be a possible perception, for it is the very notion of the permanent which renders possible the representation (perception) of a transition from one state into another, and from non-being into being, which consequently can be empirically cognised only as alternating determinations of that which is permanent. . . . Substances (in the world of phenomena) are the substratum of all determinations of time. . . . Accordingly, permanence is a necessary condition under which alone phenomena, as things or objects, are determinable in a possible experience."

Now the point of this demonstration lies, as the reader will see, in showing, or attempting to show, that experience of change is not possible unless we assume unchanging substance. Therefore, if we can experience changes (as we most certainly can), we are forced also to admit the existence of that without which change would have no meaning.

Here is another argument of the same kind respecting causation which I quote from Mr. Green's Introduction to Hume (pp. 273-4) :—

> "A uniformity which can be thus (*i.e.* by a single instance) established is, in the proper sense, necessary. Its existence is not contingent on its being felt by any one or every one. It does not come into being with the experiment that shows it. It is felt because it is real, not real because it is felt. It may be objected, indeed, that the principle of the 'uniformity of nature,' the principle that what is fact once is fact always, itself gradually results from the observation of facts which are feelings, and that thus the principle which enables us to dispense with the repetition of a sensible experience is itself due to such repetition. The answer is, that feelings which

are conceived as facts are already conceived as constituents of a nature. The same presence of the thinking subject to, and distinction of itself from, the feelings which renders them knowable *facts*, renders them members of a world which is one throughout its changes. In other words, the presence of facts from which the uniformity of nature as an abstract rule is to be inferred, is already the consciousness of that uniformity *in concreto*."

In this extract the argument is, that facts are unknowable, *i.e.*, are no facts for us, except as members of a uniform nature. We may be as certain, therefore, of the uniformity of nature as we are certain that we can know facts; which is another way of saying that we need have no doubt about the matter at all.

These quotations are not long enough, perhaps, to do full justice to the argument of which they contain one statement; but they are long enough to show of what sort the argument in either case is. And the essential force or point of those arguments, as against the sceptic, seems at first sight to lie in this: the sceptic, in questioning any principle, is shown to be making an illegitimate abstraction from the relations which constitute an object, an abstraction which is illegitimate, because it renders the object meaningless and unthinkable. He has to choose, therefore, between altogether giving up the reality of the object, or admitting a principle implied by one of the relations of which that reality can be shown to consist. He cannot, in all cases at least, do the first; he is bound, therefore, to do the second.

Now, before proceeding to examine the force of this reasoning, as it is employed in proving particular points, one difficulty must be discussed which attaches to it generally.

When a man is convinced by a transcendental argument, it must be, as I have explained, because he perceives that a certain relation or principle is necessary to constitute his admitted experience. This is to him a fact, the truth of which he is obliged to recognise. But another fact, which he may also find it hard to dispute, is that he himself and, as it would appear, the majority of mankind have habitually had this experience without ever consciously thinking it under this relation; and this second fact is one which it does not seem easy to interpret in a manner which shall harmonise with the general theory. The transcendentalist would, no doubt, say at once that the relation in question had always been thought implicitly, even if it had not always come into clear consciousness; and having enunciated this dictum he would trouble himself no further about a matter which belonged merely to the "history of the individual". But if an implicit thought means in this connexion what it means everywhere else, it is simply a thought which is logically bound up in some other thought, and which for that reason may always be called into existence by it. Now, from this very definition, it is plain that so long as a thought is implicit it does not exist. It is a mere possibility, which may indeed at any moment become an actuality, and which, when once an actuality, may be indestructible; but which, so long as it is a possibility, can be said to have existence only by a figure of speech.

If, therefore, this meaning of the word *implicit* be accepted, we find ourselves in a difficulty. Either an object can exist and be a reality to an intelligence which does not think of it as under relations which, as I now see, are involved in it, *i.e.*, without which I cannot now think of it as an object; or else I am in error, when I suppose myself and other people to have ignored these relations in past times. If the first of these alternatives is true, the whole transcendental system, as I understand it, vanishes in smoke; if the second, it comes into apparent conflict, not only with science, and with the avowed scientific opinions of many of its disciples, but with the later form of the Transcendental Philosophy itself. For by that system the development of thought is in stages; it is driven on by its own proper nature from one stage to another till the highest of them is reached, where alone it can find rest and satisfaction. But those who believe most firmly in this theory by no means intend to assert as an historical fact that every thinking being is intellectually restless until he has grasped the Philosophy of the Absolute. What they must rather be held to mean is, that the inadequacy and self-contradiction of a universe thought under any of the lower categories can be demonstrated, and when demonstrated to me or any other thinking being, I or he may be obliged to seek repose by including the contradictory elements under some category which shall reconcile them in a higher unity; but they must admit that, as a matter of fact, this demonstration has been vouchsafed to few. There are not many, for example, who, whatever their perplexities, can find intellectual satisfaction in such a formula as this: "The universe is the process whereby spirit externalises itself, or manifests itself in an external world, that out of this externality, by a movement at once positive and negative, it may rise to the highest consciousness of self" (Caird's *Kant*, p. 427). The great body of mankind certainly prefer a contradiction which they do not see, to a reconciliation which they do not understand; and what I desire is not to be shown how, on transcendental grounds, such a position is untenable, but how its existence, as a fact, is to be consistently accounted for. The analogy of the ordinary logic is here misleading. It is true, no doubt, that we may intelligently hold premisses without perceiving all or any of the deductions which may be legitimately drawn from them, and that, in asserting the premisses in such a case, we implicitly assert the conclusion; but this presents no difficulty, because it is not the recognition of the conclusion which makes sense of the premisses. In transcendental reasoning the case is exactly the other way. The ground, and the whole ground, on which we are forced by that reasoning to recognise the reality of certain relations, is, that without those relations the object of which we have experience would be as nothing for us; it would have neither meaning nor significance; and what I wish to know is, how it happens that the object appears to be "something" to so many people who are wholly innocent of any knowledge of those relations by which it is said to be constituted. If there is any value in this objection, it would apparently follow from it that movement or inference in this logic is an impossibility. So long as the transcendentalist refuses to move —so long as he merely declines to abstract the relations by which an object is already constituted,—he stands, perhaps, on firm ground; but directly he tries to oblige us to think a thing under new relations, his method becomes either ineffective or self-destructive. If, on the one hand, we *can* think the object *not* under these new relations, there is nothing in the method to compel us to do so; for the method consists in showing that without this new relation the object would not exist for us as thinking beings. If, on the other hand, we *cannot* think it except under these new relations, then, either we were not thinking it before or the relations are not new; and in either case there is no inferential movement of thought from the known to the unknown.

From these reflections it would appear that the transcendentalist must either give up the seeming fact on which his system depends, or explain away a seeming fact which is inconsistent with it. The first fact is, that a given relation is necessary to constitute a knowledge of an object; the second fact is, that a great many intelligent beings, and the transcendentalist himself during the earlier part of his life among the number, appear able to know it out of this relation.

Now, *one* solution of this difficulty has been already disposed of; it has been shown, or rather stated (for the assertion requires no proof), that a thought which is merely implicit is really no thought at all; it is a creation of language, which can constitute nothing, because it *is* nothing. It may, however, perhaps, be said that the thought is neither merely implicit nor wholly explicit, but exists in a kind of intermediate stage between nonentity and the fulness of clear consciousness; a stage in which it is strong enough, so to speak, to "constitute an object," but not strong enough to be known to the individual for whom it performs this important function.

This is apparently one of the views taken by the transcendentalist; for Kant says, with the approval of Mr. Caird, that "the consciousness (of a unity) may be but weak, so that we become aware of it only in the result produced, and not in the act of producing it; but that, nevertheless, the unity of consciousness must always be present, though it has not clearness sufficient to make it stand out" (Caird's *Kant*, p. 395). In other words, the unity of consciousness which is necessary for the existence of any experience may lie hidden, like a drop of some powerful chemical reagent, until its presence is made certain by the analysis of its results.

Such a theory as this requires us to hold that thought may, so to speak, diminish the amount of its being till it ceases to be known as thought, though not to behave as such; and no doubt the first half of this statement is correct. That a sensation can be weaker or stronger, can change its intensive quantity (to use the technical expression), is of course plain. It can also be thought of under more or fewer relations. And in both these ways it may be said to have varying degrees of being. The same may be said, *mutatis mutandis*, of thought. According as we fix our attention on the relation rather than on the things related, so we may, I suppose, say that our consciousness of the relation increases or diminishes; but the utmost diminution of which the consciousness is capable without annihilation makes no alteration in its quality; and if the consciousness vanishes, the thought must vanish too, since except on some crude materialistic hypothesis they are the same thing. This quantitative or intensive diminution of being, then, will not explain the apparent fact that so many people do not feel the necessity of thinking things under their necessary relations.

The second manner in which any object of thought can be imagined to vary its being depends on the number of relations by which it is qualified; and in this respect thought also, not less than sensation, may be said to increase or diminish. Relations may be compared and classed—that is, may be thought under relation not less than feelings; and as, no doubt, a relation which is not so compared and classed cannot be an object of thought, cannot be known as a relation, it may be supposed that here we have a definition of that intermediate stage which is required to smooth our own difficulties. Every man, it may be said, really thinks objects under the relations which seem to us, who have been enlightened by transcendentalism, to be necessary; but he is not *aware* that he does so, because he has not taken the trouble to consider them from the points of view from which alone they can appear as relations to *him*. But if this be true, what becomes of the identity of the *esse* and the *intelligi*?

If relations can exist otherwise than as they are thought, why should not sensations do the same? Why should not the "perpetual flux" of unrelated objects—the metaphysical spectre which the modern transcendentalist labours so hard to lay,—why, I say, should this not have a real existence? *We*, indeed, cannot in our reflective moments think of it except under relations which give it a kind of unity; yet once allow that an object may exist, but in such a manner as to make it nothing for us as thinking beings, and this incapacity may be simply due to the fact that thought is powerless to grasp the reality of things.

The transcendentalist, then, would seem peculiarly bound to admit what no philosopher, perhaps, would be disposed to deny, that thought which is not known as thought cannot properly be said to exist at all. He is therefore reduced to one of two alternatives. Either he must maintain that it is an error of memory and observation to suppose that every intelligence does not at all times think objects under their necessary relations, or else he must hold that a necessary relation is *not* a relation that is actually required to constitute an object for a thinking being, but is only one which, upon due reflection, a thinking being is unable to make abstraction of.

The first of these alternatives is somewhat too violent a contradiction of that experience which it is the business of transcendentalism to justify, to be seriously maintained by transcendentalists. Accordingly we find them admitting the fact that necessary relations are not always thought as qualifying the object they are supposed to constitute; in other words, accepting the second of the alternatives mentioned above, but at the same time declining any responsibility concerning a circumstance which, according to them, has to do only with the "history of the individual".

"The 'I think,'" says Kant (I am quoting Mr. Caird's translation,) "must be *capable* of accompanying all my ideas, for otherwise something would be presented to my mind which could not be thought; and that is the same thing as to say that the idea would be either impossible or, at least, it would be nothing for me." Again, "All ideas have a necessary reference to a possible empirical consciousness . . . but, again, all empirical consciousness has a necessary reference to a transcendental consciousness. . . . The mere idea 'I,' in reference to all other ideas (whose collective unity it makes possible), is the transcendental consciousness. This idea may be clear (empiric consciousness) or obscure. This we do not need to consider at present, nor even whether it actually exists at all; but the possibility of the logical form of knowledge rests necessarily on the reference of it to this apperception *as a faculty*." "In other words," says Mr. Caird, commenting on this passage (*Philosophy of Kant*, p. 396), "Kant is here examining what elements are involved in knowledge, and therefore does not need to consider how far the clear consciousness of them is developed in an individual, *nor indeed whether the individual ever actually* *develops* that consciousness at all. The individual (the sensitive being who becomes the subject of knowledge) may be at different stages on the way to clear self-consciousness. He may be sensitive with merely the dawning of consciousness: *he may be conscious of objects, but not distinctly self-conscious;* or he may be clearly conscious of the identity of self in relation to the objects. Thus we can imagine him to have many perceptions which he has not distinctly combined with the idea of self; or we may even suppose him (like children in the earliest period of their life) not to have risen to the idea of self at all, to the separation of the Ego from the act whereby the object is determined. But we cannot imagine him to have in his consciousness any ideas that are incapable of being combined with the idea of self: for such ideas would be ideas incapable of being thought, incapable of forming part of the intelligible contents of consciousness: they would be for us, as thinking beings, 'as good as nothing'. Though, therefore, we can think of an experience in which all the elements which the critical philosopher distinguishes are not consciously or separately present to the individual, we cannot think of an experience which does not imply them all."

From these extracts it would appear that both Kant and Kant's latest expositor are agreed in thinking that all that is required to constitute a perception—in other words, an experience—is *not* that the object of that perception should actually be thought in the relations which we are told are necessary to make it an object, but only that it should be *capable* of being so thought. But with such an admission the whole transcendental argument appears to me to vanish away. The rules which thought was supposed to impress upon nature, according to which nature must be, because without them she would be nothing to us as thinking beings,—these rules turn out, after all, to be only of subjective validity. They are the casual necessities of our reflective moments—necessities which would have been unmeaning to us in our childhood, of which the mass of mankind are never conscious, and from which we ourselves are absolved during a large portion of our lives. To argue from these necessities to the truth of things is merely to repeat the old fallacy about innate ideas in another form; for if thought does not make experience (and it appears that in any intelligible meaning of that expression it does not), then there is no reason for supposing that experience need conform to thought.

The net result of this discussion appears, then, to be that, according to transcendentalism, relations are involved in experience in at least two ways, the difference between which, though it is never recognised by that philosophy, is exceedingly important. According to the first way, an explicit consciousness of the relation in question is a necessary element in every possible experience; without it the experience would be "nothing to us as thinking beings," and by it, therefore, the experience may very fairly be said "to be constituted". But the number of relations, necessary in this sense, cannot be large, even according to the transcendentalists themselves; nor can the necessity ever be established by argument, since the mere fact that somebody who knows the meaning of the words he uses disputes it, proves that it does not exist. If a man does not find that a particular relation, about which there is a question, is involved in his experience, an argument founded on the fact that no experience is possible which is not in fact constituted by an explicit consciousness of such a relation, is not likely to convince him that it is there. The mere consideration that proof is required makes proof impossible.

The second way in which a transcendentalist regards relations as involved in experience differs from that just discussed in several important particulars; for whereas in *that* the explicit consciousness of the relation was required to constitute the object, in this all that is required is that the object must be *capable* of being thought under the relation. It is plainly incorrect to describe the relation in this last case as "constituting the object"; it cannot even be said that the capability of being thought under the relation necessarily constitutes it; for according to the transcendentalist, *esse* is equivalent to *intelligi*—that is, an object *is* as it is apprehended by a thinking being, and since a thinking being can, as is admitted, apprehend it without in all cases perceiving the capability, this cannot be required to render the object real. By what proof, then, is this necessary capability established? How is it involved in experience? I can imagine no other general answer to these questions but this: The transcendentalist, in bringing an object into "clear consciousness," finds himself unable to make abstraction of a certain relation, and he thereupon proceeds to elevate this incapacity into a universal or objective rule, in defiance, as it seems to me, of the fact which he himself acknowledges, that other intelligences are in no way restrained by the same limitations.

Enough has perhaps been said about this general objection (if it be an objection) to the transcendental method, and it is now time to follow the philosophers who employ it in their special endeavours to show that when the nature of experience is once brought to the "clear consciousness" of the reader, he, at any rate, can be in no further doubt as to the necessity of regarding objects in space as independent, and all objects whatever as subject to the law of universal causation.

Kant's "Refutation of Idealism" was only introduced into the second edition of the *Critique*, and was the main occasion of Schopenhauer's assertion that Kant had changed his view, between the first edition of that work and the second, respecting the external world. I understand, however, that this is not admitted by his later critics; that they regard the "Refutation" as satisfactory in itself, and as harmonising with the general course of its author's speculations; and that the proof of Realism contained in it is the one on which they would be disposed to rely. As such, therefore, I am forced to criticise it.

I say forced, because it is somewhat unwillingly that I go to Kant direct for the statement of an argument, partly because there is never any security that his disciples will admit that his reasoning in any particular case is in consonance with the rest of his system; partly because his obscurity is so great that his critics are as likely to be attacked for not understanding his arguments as for not having answered them, a proceeding by which what was intended to be a philosophical discussion is suddenly converted into an historical one. Yet the defects of his exposition are so great that no care will really avert this danger; for he has contrived to state a theory—of great difficulty in itself, and of which his own grasp does not appear to have been at all times perfectly sure—in language which always seems to be struggling to express a meaning which it can never get quite clear, and which possesses in an astonishing degree the peculiarity of being technical without being precise.

As, however, I am not acquainted with any neo-Kantian statement of the transcendental argument on this subject, it is to Kant himself that I must appeal, and fortunately the formal proof of Realism which he has advanced is so short (apart from the elucidatory notes) that I can quote it entire. It runs as follows:—

THEOREM.

"*The simple but empirically determined consciousness of my own existence proves the existence of external objects in space.*

PROOF.

"I am conscious of my own existence as determined in time. All determination in regard to time presupposes the existence of *something permanent* in perception. But this permanent something cannot be something in me, for the very reason that my existence in time is itself determined by this permanent something. It follows that the perception of this permanent existence is possible only through a *thing* without me, and not through the mere *representation* of a thing without me. Consequently, the determination of my existence in time is possible only through the existence of real things external to me. Now, consciousness in time is necessarily connected with the consciousness of the possibility of this determination in time. Hence it follows that consciousness in time is necessarily connected also with the existence of things without me, inasmuch as the existence of these things is the condition of determination in time. That is to say, the consciousness of my own existence is at the same time an immediate consciousness of the existence of other things without me." (*Critique*, Tr., p. 167.)

This proof, it will be observed, is transcendental, *i.e.*, its method of procedure is to show that an experience which we certainly have—that, namely, of the series of our mental states as they occur in time—is impossible unless the thing to be proved, which is stated (though, as we shall see, incorrectly stated) to be the existence of external objects, be admitted. And the demonstration consists of two steps. First, it is asserted that the experience of a succession of things in time is impossible except in relation to something permanent, or, in other words, that the perception of change is inconceivable unless we at the same time perceive something which does *not* change. And in the second place, Kant goes on to say that, since that which changes in this case is myself (my phenomenal self), since the "things" which succeed each other in time are my own mental states, the unchanging object to which they are referred must be *outside* myself; that is, must be the external object whose existence was to be proved. So that if we immediately perceive the one, it can only be on condition that we immediately perceive the other also.

Such is the formal answer which Kant has given to Idealism; but it is not in this way only that he has treated the question, since in his proof of the principle of Substance (which precedes the "Refutation" in the *Critique*) he has brought forward arguments which, if sound, would seem to render any further refutation superfluous. For the "First Analogy of Experience" asserts this, "That in all changes of phenomena substance is permanent; and the quantum thereof in nature is neither increased nor diminished." (*Critique*, p. 136.) And as by *substance* Kant means something which, if it is not (as I think it is) exactly equivalent to what is commonly called *matter*, is at any rate the genus of which matter is one species; clearly this proposition is absolutely inconsistent with Idealism in the sense in which I use the term. If matter is permanent and indestructible, we need not further trouble ourselves as to whether there *are* or are *not* in nature other things besides our conscious states.

The proof of this principle of Substance, which I give partly in Kant's words, partly in Mr. Caird's, and partly in my own, runs somewhat in this way:

> All phenomena exist in time. Change is only conceivable in an unchanging time. But this time is not, and cannot be, itself an object of perception, but is rather a form given to the relations of perception, which presupposes that they are otherwise related. They must be otherwise related as determinations of a permanent substance. As all times are in one time, so all changes must be in one permanent object. The conception of the permanence of the object is implied in all determination of its changes. Change involves that one mode of existence follows another mode of existence in an object recognised as the same. Therefore a thing which changes, changes only in its states or accidents, not in its substance. An experience of absolute annihilation or creation is impossible, for it would

be an experience of two events so absolutely separated from each other that they could not even be referred to one time. The "First Analogy," therefore, is a deduction from the possibility of experience, and requires no empirical proof. When a philosopher was asked 'What is the weight of smoke?' he answered, 'Subtract from the weight of the burnt wood the weight of the remaining ashes, and you will have the smoke'. Thus, he presumed it to be incontrovertible that even in fire the matter (substance) does not perish, but only the form of it undergoes a change. *(Cf. Crit.*, p. 136; Caird, p. 453.)

The reader will at once perceive that while there is much that is common to the "Refutation" and the "First Analogy," there are some arguments and doctrines peculiar to each, a fact which makes the satisfactory discussion of the question rather difficult; because while it is impossible to treat the two arguments as identical, it is somewhat clumsy and would lead to a good deal of repetition to consider them altogether separately. The most convenient course, perhaps, will be first to consider the points which are to be found in both, and then to proceed with the examination of their mutual relationship and with what is special to each.

The first difficulty which occurs to me, and which perhaps others may feel, refers to that "transcendental necessity" which is the very pith and marrow of the whole demonstration, both in the "Refutation" and in the "First Analogy". Is it really true that change is "nothing to us as thinking beings" except we conceive it in relation to a permanent and unchanging substance? For my part, however much I try to bring the matter into "clear consciousness," I feel myself bound by no such necessity. For though change is, doubtless, unthinkable, except for what Mr. Green calls a "combining" and, therefore, to a certain extent, a "persisting consciousness," and though it may have no meaning out of relation to that which is "not-change," this "not-change" by no means implies permanent substance. On the contrary, the smallest recognisable persisttence *through* time would seem enough to make change *in* time intelligible by contrast; and I cannot help thinking that the opposite opinion derives its chief plausibility from the fact that in ordinary language permanence is the antithesis to change; whence it is rashly assumed that they are correlatives which imply each other in the system of nature. It has to be noted also, that Kant, in his proof of the "First Analogy," makes a remark (quoted and approved by Mr. Caird) which almost seems to concede this very point, for he says *(Crit.*, p. 140): "Only the *permanent* is subject to change: the mutable suffers no change, but rather *alternation;* that is, when certain determinations cease, others begin". Now there can be no objection, of course, from a philosophical point of view, to an author defining a word in any sense he pleases: what is not permissible is to make such a definition the basis of an argument as to matters of fact; yet the above passage suggests the idea that Kant's proof of the permanence of substance is not altogether free from this vice. If (by definition) change can only occur in the permanent, the fact that there *is* change is no doubt a conclusive proof that there is a "permanent". But the question then arises, *Is* there change in this sense? How do we know that there is anything more than alternation which (by definition) *can* take place in the mutable? All transcendentalists convince by threats. "Allow my conclusion," they say, "or I will prove to you that you must surrender one of your own cherished beliefs." But in this case the threat is hardly calculated to frighten the most timid philosopher. There must be a permanent, say the transcendentalists, or there can be no change; but this surely is no very serious calamity if we are allowed to keep alternation, which seems to me, I confess, a very good substitute, and one with which the ordinary man may very well content himself.

To those who agree with the preceding account of our intellectual necessities, who can either conceive change without permanence, or are content to get along with the help of "alternation," it will seem absolutely fatal to the whole Kantian argument, both in the "First Analogy" and the "Refutation". To those who do not agree, it will only be a difficulty in so far as the existence of any mind unconscious of transcendental necessities is inconsistent with the transcendental theory—a point I have already discussed. But let us pass over this, and grant, for the sake of argument, that change in general, or the succession of our mental states in particular, can only be perceived in relation to a permanent something; then I ask (and this is the next most obvious objection) why, in order to obtain the permanent something, should we go to external matter? As the reader is aware, the "pure Ego of apperception" supplies, on the Kantian system, the unity in reference to which alone the unorganised multiplicity of perception becomes a possible experience; and it seems hard to understand why that which supplies unity to multiplicity, may not also supply permanence to succession. Kant has, indeed, anticipated this objection and replied to it; but as I understand the objection much better than I do the reply, I will content myself with giving the latter, without comment, in Kant's own words:

"We find," he says, "that we possess nothing permanent that can correspond and be submitted to the conception of a substance as intuition, except *matter*. . . . In the representation *I*, the consciousness of myself is not an intuition, but a merely intellectual representation produced by the spontaneous activity of a thinking subject. It follows that this *I* has not any predicate of intuition, which, in its character of permanence, could serve as correlate to the determination of time in the internal sense—in the same way as impenetrability is the correlate of matter as an empirical intuition." *(Critique*, p. 168.)

Though I do not profess altogether to understand the reasoning, it is, at all events, clear from it, that "the permanent" whose existence in demonstrated, must be an object of perception, a fact which is also evident from various passages in the proof of the "First Analogy," as, for instance, this: "Time itself cannot be an object of perception. It follows that in objects of perception, that is, in phenomena, there must be found a substratum," &c. *(Critique*, p. 137.) It is difficult to see indeed how that which is a quantity, incapable of either increase or diminution, can be other than an object of perception—it cannot at all events be a concept—and we may, I think, assume from the whole tenor of Kant's argument, as well as from his categorical assertions, that the substance of which he speaks is a phenomenal *thing*. But if it be perceived, and if it be a phenomenon, where is it to be found? In the perpetual flux of nature, where objects do indeed persist for a time, but where (to all appearance) nothing is eternal, who has had experience of this unchanging existence? By a dialectical process, probably familiar to the reader, we may with much plausibility reduce what we perceive in an object to a collection of related attributes, not one of which is the object itself, but all of which are the changing attributes or accidents of the object. But if this process be legitimate, the "substratum" of these accidents is either never perceived at all, or at all events is only known as a relation. In neither case can it be the permanent of which Kant speaks, since in the first case it is not an object of immediate perception; in the second it can hardly be regarded as an object at all.

"But (it may perhaps be replied), by a remarkable coincidence, science has established by a wide induction the very truth which Kant attempts to prove *à priori*. When men of science tell us that matter is indestructible, it is to be presumed that they attach some meaning to the phrase, and are referring neither to a metaphysical substance nor to an evanescent appearance. When Kant uses the same phrase, it may be supposed that he refers to the same object." For my own part, I confess to a rooted distrust of those remarkable coincidences between the results of scientific experiment and *à priori* speculation; nor does a closer examination of this particular case tend to allay the feeling. It is true, no doubt, that science asserts matter to be indestructible; but what is the exact meaning of the phrase, and what is its evidence? Can we perceive any thread of identity running through all the various changes which (what we describe as) one substance may undergo? To a certain extent science assures us that we can. There are two, though, so far as I know, only two attributes of matter, namely, its relation to a moving force and its power of attracting and being attracted by other matter, which never alter; or—to put it more strictly—if we take a certain "area of observation" (say a closed vessel) out of which matter cannot pass and into which it cannot enter, then, whatever changes occur within this, the matter there, whether always the same or not, never varies in respect of these two properties. But it has to be observed, that though we can directly perceive both velocity and weight, the fact that there are unchanging relations between a given portion of matter and a given force, or between two portions of given matter, can only be established by an elaborate process of inference involving a large number of assumptions. It might therefore be plausibly contended that, though *they* are perceived, their *permanence* is not, so that they cannot properly be said to form any permanent element in perception. Passing over this possible objection, however, and granting, for the sake of argument, that we directly perceive the permanence of these two properties of matter, it is still clear that, since these are the only two properties of which we can say as much, either they must constitute matter, or matter, in so far as it is permanent, cannot be an object of perception. The first alternative is inadmissible, because these properties are merely relations between certain portions of matter and something else. The second would seem to be inconsistent with the Kantian proof.

The reader will understand that I am not here contending that Kant's conclusion is inconsistent with science, or that the scientific inference is wrong, either in its method or its results. My point is rather this:—Though Kant does not, of course, conclude to the necessary permanence of matter merely from its permanence in perception, nevertheless its permanence in perception would seem to be involved in his proof. Now I assert that what we perceive, *in so far as it is perceived*, is either not matter or is not permanent; and I maintain that an examination of that part of the ordinary scientific or empirical proof which bears on the question really confirms this view.

It may perhaps be thought (and some of Kant's expressions countenance the view) that he means to say no more than that we perceive the permanent substance by means of certain of its accidents. But this seems to raise new difficulties. First, how is the phenomenal substance, thus mediately known, to be distinguished from the *noümenal* substance, which, if it be known at all, is known precisely in the same way? Why should we suppose it to be in time or space? Why should we suppose it to be a quantity? And how, finally, can we say, with any meaning, that such a substance is phenomenal at all? To put the matter in one sentence: When Kant says that "all determination in regard to time presupposes the existence of something permanent in perception," if his assertion is to be taken literally, it is in contradiction with experience, for there is nothing permanent in perception, unless we choose to describe the relations of matter to force and other gravitating matter in that way; if, on the other hand, he means that what we perceive *indicates* the existence of something permanent, he has first got to prove the fact, and has then got to show that the permanent whose reality is thus established is identical with the external world of science and common sense; and lastly, to point out how we can be said to be "immediately conscious" (*Critique*, p. 167) of that which we only know through, and by means of, its attributes.

Such, then, are the chief objections which, as I think, apply with equal force to the "First Analogy" and the "Refutation". Before going on to explain two further difficulties, which are particular in their nature, let me point out a curious consequence which may be extracted from the two demonstrations considered together.

Kant's argument in the "Refutation" consisted, it will be recollected, in showing that we could have no experience of our own changing mental states unless we perceived some permanent object outside us; while in the "Analogy" his argument involved the assertion that all changes are but the determinations of some permanent substance, which itself never changes. According to the "Analogy," therefore, our changing mental states, like all other changes, must be determinations, or, as they are usually called, accidents, of a permanent substance; while, according to the "Refutation," this permanent substance must be an object of perception independent of us and outside us in space,—in other words, matter. Between them these two propositions would seem to furnish a complete transcendental proof that our conscious states are mere accidents of matter; so that the crude materialism of certain physiologists, far from being the rash, not to say meaningless, conclusion of an unphilosophic empiricism, is demonstrable *à priori* by the most approved critical methods!

The only further remark I have to make on the "First Analogy" is of the nature, perhaps, of a verbal criticism. Kant speaks throughout of matter as if it were a definite quantity in nature, a quantity which could neither be increased nor diminished. But this would seem to be inconsistent with his theory that a vacuum is impossible, because if matter is wherever space is, it must, one should think, be not less impossible to conceive the first as a totality than it is to conceive the second; and the words "increase" and "diminution" must be altogether meaningless in their application to a quantity whose amount is necessarily indefinite. Kant's expression, therefore, is a somewhat loose one, and he must be held to mean simply that matter exists, and that no portion of it can be created or destroyed. I may add that in his discussion of a vacuum he points out that matter may be a quantity in more than one way, but that neither in the "First Analogy" nor the "Refutation" does he explicitly tell us in which way it is incapable of diminution. It would be interesting to know this, in order that his results might be compared with the results at which, by very different methods, men of science have arrived.

My concluding criticism refers to the "Refutation," and I must ask the reader to turn back to it, and to compare the thing which Kant announces his intention of proving, with the thing he professes to have proved. In the "Theorem," the thing to be demonstrated is the existence of external objects in space; in the "Proof," the thing actually demonstrated is the existence of things without me,—"without me" being evidently equivalent to "other than my conscious states, as determined in time". Now if these two expressions really meant the same thing, any further refutation of idealism would be perfectly superfluous. No human being that understood the meaning of his own words would for a moment deny that there were objects in space, and therefore without him in the sense of being outside his body. The real question is this—Does being in space and outside the body imply that the extended and external object is outside the mind, and other than one of a series of conscious states? The realist asserts that it does; the idealist asserts that it does not; and to assume, as Kant appears to do, that the one proposition is very much the same as the other is, in reality, to beg the whole question at issue. For unless Kant's intention is merely to demonstrate the existence of extended objects, which it is equally unnecessary and impossible to do, it must, I suppose, be to show that their existence is independent of their being perceived,—neither beginning with it nor perishing with it; and in order to do this he must prove, from his point of view, two things. The first of these is, that the consciousness of one's own existence in time is only possible on the supposition that something permanent exists outside, *i.e.*, other than, one's self; the second is, that this permanent and independent thing is extended matter. The evidence for the first of these positions I have already considered; the evidence for the second is nowhere explicitly stated; but I cannot help suspecting (though it seems scarcely credible) that Kant absolved himself from providing any, by quietly taking for granted that "outside" in one sense is equivalent to, or, at all events, necessarily implies, "outside" in the other. With the difficulty which most philosophers feel in understanding how that which is an immediate object of perception can be other than *in consciousness*, a difficulty which is certainly not lessened by the Kantian theory of space, Kant himself makes no attempt to deal.

I turn now from the transcendental proof of an External World to the transcendental proof of the Law of Causation.

In his proof of the law of Causation, contained in the "Second Analogy of Experience," Kant, if I understand him rightly, adopts two lines of argument, the one on which he appears to lay most stress being consistent neither with itself nor with the other. In discussing it I am unfortunately deprived of the assistance of Mr. Caird, who, in the exercise of his discretion as an expositor of the Critical Philosophy, has chosen practically to ignore it. I will not venture to determine whether in so doing he has or has not somewhat transgressed even the very wide limits allowed him by the plan of his work; but lest the reader should imagine that the absence of the argument I am about to state from the commentary, implies its non-existence in the original, I will ask him to consult the *Critique* (p. 142), and see whether it may not be attributed to Kant with as much plausibility as any in the whole range of the work. It runs as follows—I give it partly in my own words, partly in Kant's, though the italics are always mine:—

> "Our apprehension of the manifold of phenomena is always successive." But sometimes we regard this manifold of phenomena as constituting an object (say a house), sometimes as a series of events (as when a ship is seen to float down a river). Subjectively, in apprehension, these two series would seem to be of the same kind; objectively, as every one knows, we widely distinguish them. We no more suppose that the upper story of the house, if we begin looking at it at the top, is a phenomenon preceding in time the ground floor, than we suppose the ship is at the same time at two different places on the river. Yet in consciousness we perceive the ground floor *after* the upper story, exactly as we perceive the ship lower down the river *after* we perceive it higher up. The problem then that requires solution is this: How do we distinguish, as in experience we certainly *do* distinguish, the first series from the second? And Kant's answer is that we can only distinguish them if we regard the order of the first series as arbitrary, and that of the second as subject to a rule. "In the former example my perceptions in the apprehension of the house might begin at the roof and end at the foundation, or *vice versâ;* or I might apprehend the manifold in this empirical intuition by going from right to left or from left to right. Accordingly, in the series of these perceptions, *there was no determined order* which necessitated my beginning at a certain point in order empirically to connect the manifold." In the second case the order is objective: it in no way depends on the mode in which we

choose to represent it; and this can only be if we suppose that it occurs in conformity with a rule or law. And this becomes at once apparent, if for an instant we try and imagine the contrary to be the case. "Let us suppose that nothing precedes an event upon which this event must follow in conformity with a rule. All sequence of perception would then exist only in apprehension, *that is to say, would be merely subjective*, and it could not thereby be objectively determined what thing ought to precede and what ought to follow in perception. In such a case we should have *nothing but a play of representation*, which would possess no application to any object. That is to say, it would not be possible through perception to distinguish one phenomenon from another, as regards relation of time; because the succession in the act of apprehension would always be of the same sort, and therefore there would be nothing in the phenomenon to determine the succession, and to render a certain sequence objectively necessary. And, in this case, I cannot say that two states in a phenomenon follow one upon the other, *but only that one apprehension follows upon another.* But this is merely subjective, and does not determine an object, and consequently cannot be held to be cognition of an object—not even in the phenomenal world. Accordingly, when we know in experience that something happens, we always suppose that something precedes, whereupon it follows in conformity with a rule. For otherwise I could not say of the object that it follows; because the *mere succession in my apprehension, if it be not determined by a rule in relation to something preceding*, does not authorise succession in the object. Only therefore in reference to a rule, according to which phenomena are determined in their sequence, that is, as they happen, by the preceding state, can I make my subjective synthesis (of apprehension) objective; and it is only under this presupposition that even the experience of an event is possible."

Starting then from the succession in apprehension, or the subjective succession of phenomena, Kant had to distinguish from it—*first*, the objective *coexistence* which constitutes a thing in space, a house, a tree, and so forth; and *second*, the objective succession which constitutes a series of events. As I pointed out in the argument on the independent world, he does not, so far as I know, furnish any principle of objective coexistence, but in the law of causation he finds the principle of objective sequence. Or, to put it in a transcendental form, he holds that the experience of (objective) events is only possible if we presuppose the law of causation, and as we certainly have such an experience, &c.

Now, regarded as a proof of the law of universal causation, the argument I have just stated is scarcely worth criticising. In the first place Mr. Caird, after Schopenhauer, admits that the conclusion is inconsistent with one of the premisses. If it can be said to prove that sequence in the object is "according to a rule," it is only by showing in the first instance that sequence in the subject is arbitrary; so that the causation proved is at all events not universal. But in the second place, it does not prove, or attempt to prove, that there is actually an objective sequence according to a necessary rule, but only that *if* there is an objective sequence it must be according to a necessary rule, because otherwise it could not be distinguished from the subjective sequence. Now these are very different propositions; and the second or conditional one might be admitted to its full extent, without admitting the truth of the first or unconditional one, which is for purposes of science the proposition of which proof is required.

The second proof which Kant gives of the principle of causality is so hidden away in the recesses of the first, that some doubt might perhaps be thrown on whether he intended formally to put it forward as a proof at all. The fact that it is in direct contradiction to the first proof, does not perhaps go far towards helping us to a decision on this point; but in any case the matter is not of much importance, as I am more concerned with the meaning which the post-Kantians extract from his writings, than with that which he himself intended to put into them.

The first proof attempted to show that the experience of an objective sequence was only possible if it was distinguished from a subjective sequence by being according to a rule. The second proof attempts to show that *no* sequence can be experienced except on the same terms. It is plain, therefore, that the second proof aims at demonstrating a causation which is universal, and which cannot, therefore be reconciled with the partial causation contemplated by the first. It only remains for us to examine whether it is more satisfactory. I give it entire in Mr. Caird's words. (*Phil. of Kant*, pp. 454-5.)

> "The judgment of sequence cannot be made without the presupposition of the judgment of causality. For time is a mere form of the relation of things, and cannot be perceived by itself. Only when we have connected events with each other can we think of them as in time. And this connexion must be such, that the different elements of the manifold of the events are determined in relation to each other in the same way as the different moments in time are determined in relation to each other. But it is obvious that the moments of time are so determined in relation to each other that we can only put them into one order, *i.e.*, that we can proceed from the previous to the subsequent moment, but not *vice versâ*. Now, if objects or events cannot be dated in relation to time, but only in relation to each other, it follows that they cannot be represented as in time at all, unless they have an irreversible order; or, in other words, unless they are so related according to a universal rule, that when one thing is posited something else must necessarily be posited in consequence. In every representation of events as in time, this presupposition is implied; and the denial of causality necessarily involves the denial of all succession in time."

It appears to be asserted in this proof that we cannot conceive succession, unless we suppose that there is a necessary order in phenomena to enable them, so to speak, to correspond with and fit into the necessary order in the moments of time. "Events are determined in relation to each other in the same [*i.e.*, I suppose, *some corresponding*] way, as the different moments in time are determined in relation to each other." But in so far as I can attach any definite meaning to these words at all, they seem to distinguish two things which are really the same, and to confound two things which are really distinct. The "order" of events and the "order" of moments are not two kinds of order but one kind, and if we assert that two events succeed each other, we are describing precisely the same relationship between them as when we assert that two moments succeed each other. When, on the other hand, we assert that one event is the cause of another, we assert not only this actual succession, but also, by implication, a similar succession whenever an event resembling the cause or first term in the relationship may happen to occur. But this relationship is so far independent of time, that though it *must* occur in *some* time it *may* occur in *any* time, and it in no way corresponds with the relation between actual successive events or successive moments which can never be repeated, because the related terms can never recur. Event A and moment *a* are followed by event B and moment *b*. This happens once actually and, if you please, necessarily; but it never happens again. The events vanish into the past as certainly as the moments in which they occur, and they can as little be recalled. But all this has nothing to do with causation. What the principle of causation, strictly speaking, asserts is, not that if event A recurs it will be followed by event B, for event A cannot possibly recur; but that if an event similar to A recurs, an event similar to B will certainly follow: and how this second hypothetical assertion is involved in the categorical assertion of a simple historical succession between actual concrete events and moments, altogether passes my understanding.

The transcendental view appears to be that, because there is a necessary order between successive moments, therefore there must be a necessary order between successive events; and this desired necessity can only be found in the principle of causation. But if there was no causality at all, the order of events would still be just as much or just as little necessary as the order of moments. An event is what it is because it happens when it does. A moment is what it is because it occurs when it does. Neither the one nor the other could occur at any other time, simply because by so doing it would cease to be itself. It is true of course (and this is no doubt the cause of all the confusion) that we habitually talk of the *same* event as occurring at *different* times, while we make no such assertion respecting particular moments. But this is simply because the whole essence of a moment consists in the time at which it occurs, whereas it is commonly the case that this is the least interesting of all the relations which constitute an event, and the one of which it is therefore most often convenient to make abstraction. Nor is it to the purpose to say that events cannot be dated in relation to time, but only in relation to other events; because in every sense in which this can be asserted of particular events, it can likewise be asserted of particular moments. If, therefore, this fact necessitates causation in the one case (which, however, I deny), it must necessitate it also in the other—which is absurd.

Other objections besides these might no doubt be taken against particular points in the transcendental proof, but the best refutation of it is to be found in its own version of its general nature and object. That object is simply to show that a clear idea of succession is impossible except to those who first regard phenomena as necessarily connected according to the principle of causation; which again is as much as to say that by far the larger part of mankind have no clear idea of succession at all. And when I say the larger part of mankind, it must be remembered that in that majority are included not only all those who do not believe in the universality of causation, but also almost all those who do; since I will make bold to say that the greater number of these, however much they turn their minds to the nature of succession in time, do not find involved therein the principle of cause and effect. This necessity, then, under which the transcendentalists labour, if it is to be of "objective" application, and is to have any philosophic value at all, requires us to believe that mankind has been, and is, suffering under a very singular illusion respecting the clearness of its own ideas, on a point which is commonly thought to be so simple as to defy further analysis. This by it itself is sufficiently hard to believe; and the difficulty does not diminish when we come to examine the matter more closely. For what does the supposed necessity oblige us to hold? That when we perceive two events in succession, the first is the cause of the second? Not at all. But that when we perceive two events in succession, there exists *somewhere* a cause for the second—a cause possibly (indeed, probably) of which we are, and shall remain for ever, ignorant! So that what the transcendental doctrine comes to is this, that we can have, and do have, an idea of succession which is not causal, but that we cannot have such idea, at least in "clear consciousness," which does not involve the idea of some *other* succession which is indeed causal, but one element of which is, or may be, quite unknown to us!

On the whole, then, I cannot agree with Herr Kuno Fischer that Kant's "giant strength" (Fischer's *Kant*, Tr. p. 118) has been very happily employed in this attempt to place the doctrine of causation beyond the reach of sceptical attack; on the contrary, it seems to me that all the difficulties inherent in the transcendental method, and all the confusion and obscurity which are so often to be met with in Kant's use of that method, are strikingly exhibited in his treatment of this central and important principle. It is commonly asserted that it was Hume's theory (that our expectation or belief in the uniformity of Nature is the result of habit) which suggested to Kant the necessity of finding some more solid basis on which to rest our systematic knowledge of phenomena. If so, it is unfortunate that it should be precisely at this point that the ingenious and important method of proof which it is his chief glory to have invented, most obviously and completely breaks down.

I have only to point out, in conclusion, that had the transcendental demonstration been as sound in all its parts as Herr Kuno Fischer and Mr. Caird suppose it to be, the thing proved is not sufficient by itself to serve as a basis for scientific induction.

All that Kant can be said, on the most favourable view of his reasoning, to have established is that, to use his own words, "the phenomena in the past determine all the phenomena in succeeding time"; or, as Mr. Caird phrases it, "the subseqent state of the world is the effect of the previous state". But something more than a fixed relation between the totality of phenomena at one instant and the totality of phenomena at the next instant, is required before we can, in the scientific sense of the expression, assert that these are "laws of nature". A law of nature refers to a fixed relation, not between the totality of phenomena, but between extremely small portions of that totality; and it asserts a fixed connexion, not between individual concrete phenomena, but between classes of phenomena. Now by no known process of logic can we extract from the general proposition, that "the subsequent state of the world is the effect of the previous state," any evidence that such laws as these exist at all; and what is more, this general proposition might be perfectly true, and yet the course of nature might be, to all intents and purposes, absolutely irregular, even to an intelligence which, very unlike our own, was able to grasp phenomena in their totality at any given moment. For "regularity" is an expression absolutely inapplicable to series in which there is no kind of repetition; and we have no reason for supposing—from the point of view of science we have every reason for *not* supposing—that the world will ever return exactly to the same state in which it was at some previous moment.

If therefore we have grounds for believing that the states of the universe at two successive instants are connected only as wholes, and not necessarily by means of independent casual links between their separate parts, then of such a universe we could say, perhaps, that its course through time was *determined*, but we could not say that it was *regular*, nor would it be possible for a mind, however gifted, to infer, by any known process of reasoning, its future from its past.

ARTHUR JAMES BALFOUR.

V.—PHILOSOPHY IN ITALY.

DURING the seventeenth and eighteenth centuries, while the field was occupied in France and England by the schools of Descartes and Locke, followed by the scepticism of Hume and by the *Encyclopédie*, and while Leibnitz and Wolff flourished in Germany, Italy had no speculative movement of its own. penetrating to the depths of the national thought, and constituting a true tradition of philosophical study. On the decline of the splendid era of the Renaissance, when the arms of the foreigner were pressing heavily on the Peninsula, civil and political liberty died out, and with it all intellectual life, save only what still managed to survive in the departments of history and natural science. We were then as if cut off from the current of Modern Philosophy. The germs deposited by our thinkers of the second half of the fifteenth century ripened and bore fruit elsewhere. With us there remained only the galvanised Scholasticism of the Jesuits. Giovan Battista Vico, a solitary genius and pioneer of modern thought, died poor and uncomprehended. When the revolutionary storm of 1789 burst upon us, we were so flooded by French ideas, that at the beginning of this century those Italians who did not profess the theology of the Church of Rome were, with few and rare exceptions, followers of the *Encyclopédie*, Condillac and Cabanis. Genovesi at Naples, and Gioja and Romagnosi in the north of Italy (though the last-named refuted the theory of Transformed Sensation), applied the principles of Sensationalism to psychology, and to political economy with the other social sciences. Judicious writers, of no great speculative originality but of extensive and solid learning, and aiming at essentially practical ends, they betrayed in every portion of their works, even to their frenchified style, the influence of foreign contemporary authors. A doctrine which, though not unaffected by Kant's philosophy, might yet be said to be in part original and Italian, first appeared in the writings of the Calabrian, Pasquale Galluppi. Then, in 1830, the Abate Antonio Rosmini of Rovereto (long before his death) published at Rome his *Nuovo Saggio sull' origine delle idee,* and this, followed by the works of Vincenzo Gioberti, started the only philosophical movement that has exercised any wide influence on our national thought and life.

I. This movement, which occupied the whole of the second quarter of the present century, succeeded in giving a kind of unity to speculative studies in Italy by trying to reconcile the traditions of the past with the new needs of the present, Catholicism with Philosophy, and native with foreign thought. To give effect to this attempted reconciliation, and to render it an active element in the national restoration, it was enough that it should be thought possible; which it was—under the influence of that sentiment and those political ideas which are the historical factor that must be kept constantly in view for the right understanding of the various manifestations of intellectual life in Italy. But of our three principal philosophers, Rosmini and Gioberti alone exercised a wide civil and political influence. The doctrines of Galluppi had a character and purpose essentially speculative. Born in 1770, and reaching the age of 49 before the publication of his *Saggio filosofico sulla Critica della conoscenza,* Galluppi did not come to be known throughout Italy till 1827, while his influence, especially in the north, was soon superseded by that of Rosmini and Gioberti. Rosmini, with a mind of greater power and breadth, conceived in his youth the system which occupied his mind all through life, and as a man, as a philosopher, as the founder of a monastic order, and as the intimate friend of the most illustrious men in Italy, he wrought far more deeply on his fellow-countrymen. The course of events and the tendencies of European culture from 1815 to 1830 favoured the direction which he gave to Italian thought, and its counterpart is to be found in the line taken about the same time in literature by Manzoni (afterwards a friend and disciple), following in the wake of the German Romanticists. It was a reversion to the Christian Idealism of the Middle Ages, of which the tradition still lingered in a portion of the Italian clergy, and at the same time it was an attempt to bring into greater prominence the Platonic element in this doctrine, harmonising it as far as possible with the spirit of modern philosophy and polity.

This purpose is especially discernible in Gioberti, joined with a much more pronounced tendency to identify religion and philosophy and make them the spring of a new national life. In his works written during exile in France and Belgium (1833-48), he plants himself, as it were, on the height of the Christian idea of creation *ex nihilo,* and surveys, in one wide sweep, all the consequences that seem to him to flow from this principle in every department, whether of philosophy, or science, or polity. It is well-known what an impulse was given to the revolution of 1847-48 by his *Primato morale e politico degl' Italiani.* The proposition maintained in this eloquent book—that Italy, as being the custodian of the most ancient religious and moral ideas and the see of the Pontificate their interpreter and depositary, is the first nation in the world—was only a splendid dream; but the immense force with which this dream worked on the minds of Italians, creating in them for the moment a wonderful unity of aspiration, was due to its being the truest expression of the want which then began to make itself felt in every part of Italian life—the want, namely, to convert all the memories of our past into a living present power. Now the past, whose memory lingered most vividly in Italy, especially amongst the common people and the clergy, was that of our mediæval commonwealths united, in their best and earliest days, under the protecting power of the Pope. Turning, then, to this Guelph tradition, at once religious and liberal, and pointing to it as the only signal of concord between divided parties, as the only way out of the darkness of plot and conspiracy into the open light of a great and united national enterprise, the school of Manzoni and Pellico (with which also Cesare Balbo partly sympathised) was able, by help of Gioberti, to put itself at the head of the political movement of 1847, and to give it the first and strongest impulse. Till then the Platonic-Christian Idealism of Rosmini had continued mainly speculative, or had only been able to lift a part of the clergy out of the Scholasticism of the Jesuits into a purer and freer thought. Through Gioberti it passed at once to the heart of Italian life, and diffused itself through a great part of society. The works of Gioberti, even the most abstract like the *Introduzione allo studio della filosofia,* being read and criticised from one end of Italy to the other, re-awakened the interest in speculative studies that had been slumbering so long. They also prompted a wider study of the works of Rosmini, which, owing to their somewhat severe and systematic character, were for long confined to a small circle of readers. Rosmini, who combated the doctrine of the temporal power of the Popes in his work *Delle cinque piaghe della Chiesa,* himself took part in the political events of 1848, when he was sent to Rome by Gioberti, then the minister of Charles Albert, to induce the Pope to take part in the war against Austria and to establish the bases of an Italian league. At that time Terenzio Mamiani was constitutional minister of Pius IX. These three leaders of our philosophical movement, forgetting the controversies that had hitherto divided them, now worked towards a common end in the interests of Italy. For the first time in history there was presented the example of a revolution promoted by speculative ideas, in harmony for a time at least with facts, and going very far to realise the perilous Platonic ideal of a nation headed by a philosophical mind. Nor was this a merely accidental feature of our national revival; it was rather the ultimate expression of the most general fact embodied in it, at once supplying the key to its whole meaning and revealing the constant tendency of all the moral and intellectual forces in the country to subserve one great political aim—the attainment of unity and independence. Literature, operating through the classical and romantic schools of Parini and Alfieri onwards to Manzoni, Niccolini and Giusti, had paved the way for the revolution among the cultured and citizen classes; and in the same direction the people, the clergy, and even the Pope himself, were led under the combined influence of philosophy, literature and religious feeling.

II. The issue of that revolution is known to all. 1848 and 1849 mark an epoch in the history of our modern thought and literature, the effects of which are still felt by us. The deep sense of disappointment under the hard test imposed on the ideals of our poets and philosophers by the contact of events, and the new direction given to the National Union party after 1852 by the hand of Cavour, had a powerful influence on our literature in separating it entirely from politics, by which till then it had been dominated, and also on our philosophy in estranging from the doctrines of Rosmini and Gioberti all (especially clerics) who had given a welcome to them solely because they were a compromise between theocracy and liberalism, between religion and science. No sooner did this compromise appear to be, as it really was, an impossibility, and come under the condemnation of Rome, than timorous minds quitted the camp of philosophy for that of faith, the ranks of Christian Platonism for those of Aristotelianism and the Scholastic Thomism professed by the Jesuits, who had been combated to the death by Gioberti and in their turn had never ceased to combat him.

It was opposition of another kind that was offered to the doctrines of Rosmini and Gioberti by those who either had adopted them because they were an advance upon scholastic dogmatism in the direction of modern philosophical principles, or who had kept aloof from them in the very name of those principles. This opposition was all the more serious because it derived its force from the contradiction inherent in the doctrines in question—the contradiction, namely, between mediæval dogmatism and the critical spirit of modern philosophy, between the principles of Catholic theocracy and those of liberal thought. These two irreconcilable elements had been, so to speak, laid the one above the other in the philosophy of Rosmini and Gioberti, but the dogmatic and theological element had greatly the preponderance. How this came to pass is easy to see. We were the last to join the movement of modern intellectual life, and, like a man awaking from a long sleep who takes a backward glance over the road already travelled before resuming his journey, our thought, which had hardly been awakened by Galluppi, turned with Rosmini and Gioberti to the philosophy of the Fathers and Doctors of the Church; for in them was presented a tradition of well-defined doctrine and the only tradition which since mediæval times had not entirely died out in our schools. Towards the close of 1834 Terenzio Mamiani, then an exile at Paris, set himself to take up again the thread of our traditional speculation at the point where it had been broken off in those philosophers of the fifteenth and sixteenth centuries who were the forerunners of the modern era. At that time Mamiani professed the philosophy of Experience (a doctrine nearly related to that of Galluppi), and in the name of this philosophy, which he thought more consonant both with tradition and with the genius of our people, he desired to wrest the direction of the Italian philosophical movement from the hands of Rosmini and Gioberti. But this design of his was not, and could not be, accomplished in the conditions of philosophical study then existing in Italy. The daring speculations of Leonardo da Vinci, of Bernardino Telesio, of Bruno, of Campanella, the predecessor of Bacon and Descartes, had not left among us any point of support, any philosophical tradition whatsoever to which this new intellectual movement might attach itself. The only philosophical tradition besides the Thomism professed by the Jesuits, which had never altogether died out in Italy especially among the clergy, was the Christian Platonism of the Fathers and Doctors, particularly St. Augustine, St. Anselm, St. Bonaventura, and to some extent also St. Thomas. It is well known how highly Vico esteemed Plato, and how much he meditated upon the Fathers and Doctors. Among the principal representatives of Idealism in union with Catholic doctrines, in the second half of last century, were Cardinal Sigismondo Gerdil (whose influence on philosophical teaching was felt chiefly at Bologna, Rome, and Turin), and Vincenzo Miceli, parish priest of Monreale in Sicily, where he had many disciples. If then it be remembered that in Italy even till well into the present century, philosophy had scarcely got out of the hands of the clergy and the seminarists; that to the clergy belonged Rosmini and Gioberti, and the majority of their followers; and that one of the chief aims of the teaching of these philosophers was to bring about that reconcilement of reason with religious authority that had already been tried by the Scholastics,—it is not at all surprising that the theological element should be found to predominate greatly over the rationalistic. Excepting Galluppi, a layman, and one who keenly felt the influence of the Rationalism of the preceding century and of Kant's *Kritik*, we cannot say that either Gioberti (at least in his early works) or Rosmini himself, however much he owned to having received powerful impulses from Kant, was deeply impressed by the spirit of modern philosophy. Now and again they touch its threshold and cast glances over it, but they lack the courage to pass within. In more than one place in the *Nuovo Saggio* Rosmini is moved by an impartial love of scientific inquiry—that same speculative need which prompted Kant to ask: "How is the fact of knowledge possible?" But it is only in the external form and expression given to the critical problem, and in some of the conclusions arrived at, that he comes near to Kant. The substance and foundation of the *Nuovo Saggio* are drawn from the theological and dogmatic ontology of the Christian Fathers and Doctors. With them the author is substantially at one as regards the ruling *motives* of his inquiry, and he never allows the freedom of his thought to go the length of admitting that anything can be true to a philosopher which is incompatible with religious faith. That is to say, Rosmini regards the agreement of the latter with the results of philosophical investigation as a postulate. Gioberti, in his earlier works, goes even farther than this. Not only does he identify philosophy and religion, but he recognises in the spirit a faculty *sui generis*, superior to reason and having the supernatural for its object. Viewing the doctrines of Rosmini and Gioberti mainly from this point of view, Cousin, therefore, had ground for asserting that Italian thought was still "in the bonds of theology".

III. Of all our thinkers, Galluppi, is in many respects the one most penetrated by the secular and modern spirit. For him the examination of the validity and limits of knowledge is not merely the principal, but the only, question of philosophy—which he defined as "the science of human thought". A born psychologist, a clear, calm and rigorous reasoner, he directed all his investigations towards one object, namely, that of showing how from the feeling of the Ego and its modifications (identified by him with consciousness) come all the materials of our ideas, and how these, stored up by the imagination, and separated and combined by voluntary analysis and synthesis, build up the whole system of our cognitions. This doctrine touches Kant's *Kritik* at some points, and resembles it in its more general features, but differs in its foundation, and still more in its conclusions. Galluppi does not allow that there are any true and proper *à priori notions* other than these two—desert and duty. The theoretic activity, according to him, is receptive and not spontaneously productive. The form of knowledge is derived and extracted from the matter of experience, which contains it, as it were, in germ; and though for the elaboration and transformation of this matter there is need of subjective elements, the *synthetic unity* of thought, presupposed by this elaboration, is based upon the *metaphysical unity* of the Ego, conceived as a thing-in-itself. Thus Galluppi's Subjectivism trenches on a psychological Realism, and he is brought near to Reid and the Scottish School, to whom he gave much study. Among his propositions, these two recur most frequently: "Sensation is objective"; "Thought is reality in itself". Galluppi had an extensive and precise acquaintance with the history of modern philosophy, and it is one of his chief merits that he was the first to introduce and diffuse its study in Italy.

In Rosmini and Gioberti, Critic is expanded and exalted into a true and proper Metaphysic; the doctrine of knowledge, or Ideology, while holding always the first place, is brought into close union with the doctrine of being, or Ontology. Of the two, Rosmini is more nearly related to Kant, alike in native intellect and power of introspective analysis, and in his way of setting forth and handling the critical problem. In this respect superior to Galluppi, who confounds consciousness with feeling, Rosmini sees with Kant that the whole problem of knowledge reduces itself to the inquiry how by the concurrence of sense and intellect things, which are apprehended simply as *representations* and *intuitions*, come to be understood, to be thought and *conceived* as *objects*, according to certain necessary and universal laws; that this *knowability* can come to things of sense only through the intellect and consciousness; that the union of the one with the other, of the matter of knowledge with its form, is possible only through the medium of a primitive judgment, of which the subject, particular and singular, is given by sense-intuition, and the predicate is furnished by the mind; wherefore, *to know is to judge*. Kant and Rosmini thus agree in keeping the critical problem within the limits of psychology; they both recognise the ideal form of knowledge as its true constitutive part; both regard synthetic *à priori* judgments as essential to its production. Rosmini, however, restricts these to one, while he gives to the form of knowledge an origin and a value very different from what the *Kritik* assigns. According to him Kant's capital defect consists in not having reduced to a minimum the formal part of knowledge and in not having deduced it from a single principle. This is what the Italian philosopher attempts to do, and on this he grounds the claim he makes to superior originality in the *Nuovo Saggio.* He aims at showing that all Kant's forms and categories presuppose one single and simplest form, that, namely, of mere possibility and ideality, the idea of *indeterminate being*, which is inborn, and which becomes determinate in its union with the real, given by sensation. The essential constitutive act of all knowledge, therefore, consists of a primitive and direct synthetic judgment, in which the idea of existence is added as a predicate to sensation; an act, which is completed in intellectual perception, and is expressible by the formula—"That of which I am sensible exists".

So far the difference between Rosmini and Kant will not seem very great. But it becomes a substantial one, when we consider the value he assigns to the form of knowledge and the source from which he derives it. From this point of view the Italian philosopher is seen to be essentially dogmatic as regards both the ground and the spirit of his doctrine. In Kant, the doctrine of knowledge is the base and condition of the doctrine of existence; Metaphysic presupposes Critic. With Rosmini, the reverse order is the proper one. The end constantly aimed at by him is to establish the *reality* of knowledge, by giving to it an object that is necessary, infinite, and superior to thought. This object of thought, *the ideal indeterminate existence,* is divine in its origin; it is "the light which lighteth every man that cometh into the world". It acts as the mediator between our mind, which intuitively perceives it as a universal idea, and the reality of particular things, which comes to us solely by feeling. This doctrine, while it does not seem to me to succeed in establishing the objective truth of knowledge and inclines to a mystic Idealism, is yet far enough removed from the deeper meaning of the *Kritik,* to which, however, some of its Italian interpreters would fain accommodate it. The essence of the Kantian doctrine, as shown by Fichte, consisted in regarding knowledge and its laws as a product of the mind's proper activity. The Rosminian theory, on the other hand, really would make the divine light of intellect to descend from above upon the human mind, and by it be received and reflected on sensible things.

Gioberti, in the first form of his philosophy, started from an innate ideal intuition. However, in opposition to Rosmini, he maintained that as the divine ideal could not be manifested to us without a manifestation at the same time of the divine reality, the infinite *Ens* became the natural object of our mind both as an idea and as a reality, distinct from finite *existences* yet so far related therewith as to produce them by free creation *ex nihilo.* This native intuition of creation, which reaches back to the first beginnings of thought, but which, though it is implied in every conception, is first clearly revealed to the matured and scientific consciousness that explains and demonstrates it, takes the form of a primitive synthesis, or first judgment, to which Gioberti gives the name of ideal formula: *The Ens creates the existent.* It is the *fiat* of Genesis placed at the head of all science. And it is to be noted, that while for Rosmini the synthesis of the ideal with the real is *effected* by the mind in intellectual perception, and sense-experience furnishes the second element; for Gioberti, on the other hand, this synthesis is *already given* as a primitive intuition, which containing it contains also the confused ideal apprehension of every finite reality, and becomes, if I might so call it, an *à priori* anticipation of experience. Feeling does nothing but add the fact of perception to these its prior and essential conditions. Thus the whole activity of scientific thought is reduced to the function of translating into reflective form the internal speech of an immediate and divine revelation, with which corresponds external speech—language that serves as an indispensable medium to the operation of reflection, and is itself of divine origin; for according to Gioberti man was created with the faculty of speech. It is easy to see, then, that for him science is essentially an *à priori* process, starting as it does from the Absolute, from the *idea*, which stands first in the logical and psychological order of cognitions. Further, the introspective inquiry into the facts of mind must reduce itself to a very small matter in a system whose principle is so far removed from experience, analysis, and accurate and patient induction.

In this respect, indeed, Gioberti's teaching marks a distinct retrogression in the history of our more recent thought. With Galluppi and Rosmini the faculty of observation and critical analysis is supreme, and some parts of Rosmini's *Nuovo Saggio*, and of his *Psychology*, *Anthropology* and *Logic* may rank with the best productions of modern philosophical thinking. Vincenzo Gioberti joined to some of the most brilliant qualities of the philosopher all those of the orator; great elevation of feeling; a wide and happy perception of the relations binding ideas and facts; a power of soaring to the highest pinnacles of thought, and thence taking in at a glance a vast range of practical applications and consequences; also, a great fervour and sincerity of convictions, which he had the art of communicating in their full intensity to the reader's mind. But with all these qualities, he had not the patient persevering force of thought that advances with slow but sure step, and regards truth, not as a haphazard and fortuitous conquest, but as a legitimate possession, reserved for him alone who can vindicate his claim to it by the best reasons. No modern philosopher, not even Schelling himself to whom he bears some resemblance, delights more than Gioberti in imaginary syntheses, lacking the due preparation of careful analysis. Hence the cordial and, as Schopenhauer would say, the truly theological hatred with which he pursues psychology and psychologists, particularly Descartes, their father. The influence of the Giobertian school (which from 1842 to 1850 was considerably larger than the following either of Rosmini or Galluppi) was very hurtful in two ways. It diverted attention from serious and patient thought, and from the psychological inquiries started by Galluppi and Rosmini; while its return to the theological dogmatism of the Middle Ages could not but provoke a reaction as extreme as had been the enthusiasm with which it was originally embraced in the political excitement of the time.

IV. I have already pointed out that the occasion of this reaction was the events of 1848 and 1849, and that its true efficient cause was the contradiction that underlay the principles and elements composing the new Italian philosophy. What has been said is sufficient to show that the first impulse to this philosophy and the form of some of its principal problems were certainly derived from Kant's *Kritik;* but that the matter and spirit of its doctrines, with their tendency towards certain final conclusions, came to it from Catholic theology. The modern element overspread the old, but did not succeed in interpenetrating it. It has been said of Galluppi and Rosmini that they were Kantians without knowing it, and the observation, apart from the conclusions that are sought to be drawn from it, has a basis of truth; but the fact that, "without knowing it," they were in contact with modern philosophy, while they were moved by principles diametrically opposed to it, is the very reason why they are so far separated from it both in substance and in spirit. Nevertheless, theirs is the merit of having opened out for Italian minds a way by which to enter the current of modern ideas. They showed their countrymen what maturity of thought was necessary before they could assimilate the products of modern philosophy and civilisation.

The maturity of mind and culture developed in Italy especially during the second quarter of the century was not, however, wholly or even in greater part the work of philosophy and science, as was the case in Germany. With us it was mainly the result of political revolution and of the closer sympathy which this set up between our national spirit and that of the other European peoples. The revolutionary movements extending from 1821 to 1847, the price we had to pay for the work of renovation that gradually penetrated to every part of Italian society, were the means of introducing modern principles; and this more by way of sentiment, literature and art, than of speculative and abstract thought.

After Genovesi, Romagnosi and Galluppi, who belonged rather to the age of 1789, philosophy long remained too much occupied with a priestly "vision of the Absolute and eternal ideas," to be able to appropriate whatever of a more modern, youthful, and promising spirit was stirring in the breasts of the new Italian generation, and stamping them with a mark of its own. This it was that caused the doctrines of Rosmini and Gioberti, notwithstanding the favour shown them at the beginning of the revolution of 1847-48, to have the power only of starting it, not of directing it, and still less of conducting it to a definite issue. Giuseppe Mazzini and, in a different way, the author of *Arnaldo da Brescia*, took from the outset a much clearer view of the course and probable outcome of Italian affairs. They felt that the principles with which philosophy, in Gioberti, had placed itself at the head of the national movement, no longer represented the deeper convictions of that portion of society which alone was fitted to conduct the revolution to an end and establish a new order of things. The ideas of the more youthful and energetic minds in Italy had kept pace with those of French society from 1830, while in those provinces of the north and south where the German philosophers were most studied the atmosphere of thought was very different from that in which the doctrines of Rosmini and Gioberti sprang up. Whether monarchists or republicans, classicists or romanticists, the "Unionist Liberals" were all agreed on one point—to break, with the past and with Rome in politics, and in philosophy to liberate human reason from every kind of religious authority and theological bondage. The Encyclical of the 29th April, 1848, revealing the impossibility of any kind of agreement between the Pope and the national party, only confirmed from without what had already been felt and foreseen by many. And, however the various parties might differ in their view of the means, the end that sooner or later became clear to the minds of all was the necessity of giving the lead of the national movement, in the order of ideas as well as of facts, to the secular principle: Rome must be left aside. This, which was really the overthrow of the political and philosophical creed proclaimed in Gioberti's *Primato*, was the program of the great Unionist party that from 1850 onwards had its centre in Piedmont, its arm in the Royal

House of Savoy, and its head in Cammillo Cavour. The fact that this party should, at so short an interval from the illusions of 1848 and 1849, have been able so clearly to see the goal towards which the nation was tending, shows how ripe was its consciousness of the new times, with their new needs and interests. But to my mind still more notable is the fact that the first inspirer and apostle of this new national enterprise, the unification of Italy through the instrumentality of the house of Savoy, was none other than Gioberti himself, who foretold it in his *Rinnovamento,* written at Paris, where he had gone on a diplomatic mission after the battle of Novara, and where he remained a voluntary exile till his death in October 1852.

V. Gioberti's posthumous works, the *Protologia,* published by his disciple, Giuseppe Massari, in 1857, made up though they be for the most part of fragments, and certainly containing no well-defined body of doctrine, yet suffice to show us how the same change that had come over his political ideas since 1849 had affected (but perhaps a little earlier) the foundations of his speculative thought. This change was not, and could not be, an evolution from the previous doctrines professed by the philosopher of Turin; it was rather their antithesis. In the *Rinnovamento* the headship of Papal Rome and the superiority of the spiritual over the temporal power, proclaimed by the *Primato,* gave place to the headship of Piedmont and the liberation of the State from the Church. In the *Protologia* not only was religion no longer, as it had before been, identified with philosophy, but it was entirely separated from it, and so far from the authority of faith being allowed to bear down the free examination of reason, it was put under subjection, reason being endowed with full power to interpret and explain from its proper data the existence and truth of religion. This new conception of Gioberti's in regard to the value and power of reason substantially modified his teaching, at the same time that it brought him very near to Hegel. To the Italian philosopher the Absolute Idea became what it was to the German—the essence and basis of things and of spirit. It is no longer opposed to finite thought, by which it is intuitively, though vaguely, perceived as an object superior and external to itself, but it is transformed into an absolute thought, which is inherent and immanent in human thinking, and creates it, or, as Gioberti says, posits it. The dialectic law of this absolute thought is the law of things and of being; human reflection, aided by language, only serving to translate the infinite idea into conceptions and their signs, without however being able at any time to reach its deeper meaning. In his doctrine of the creation likewise, Gioberti takes up different philosophical ground in the posthumous works from that first occupied by him. While remaining faithful to his "ideal formula," and attempting every mode of escape from Pantheism, he admits the existence of a substantial relation between the world and God, who is for him the infinite in action, in whom the finite exists potentially as an indefinite possibility, previous to its determination outwards and its limitation in action. In its potential aspect, therefore, the Universe is God himself; and Gioberti does not hesitate to name it with Cardinal di Cusa "a potential God," a "*Deus contractus*".

This doctrine is a bold attempt to reconcile Plato with Hegel and with the principles of Christianity, from which Gioberti did not even now dare to break away altogether. The imperfect form in which it was left at his death, makes it impossible to say with certainty what place it might have come to occupy in the history of modern philosophy, had he been able to attain to a full understanding of the new direction and tendencies of his thought. But amid all the passionate disputing that goes on in Italy between those who deny any substantial novelty to the posthumous works, and those who would make out their coincidence with Hegelianism, one thing at least is clear, that in them the rationalistic element prevails greatly over the dogmatic and theological, however much the philosopher may still strive to reconcile the two. His mind, large as his heart, seemed destined to be the living embodiment of the mind of his country; and, just as between 1833 and 1846 his thought was crowned by the Utopian idea of an agreement with the past and with Rome that paved the way for the revolution by mediating between the clergy and the people, so now after the sad experience of facts he found himself irresistibly impelled to make common cause with those who had their gaze turned towards the future only. Proof of this appears in the friendship that bound him during the last years of his life to various republicans—among them Giorgio Pallavicino. The *Correspondence* of the philosopher with the democrat of Genoa, lately published at Milan by B. E. Maineri, is one of the most interesting books that can be read by those who desire to know thoroughly the latest period of our revolution. Between the author of the *Rinnovamento* and the young national party there was, however, one great difference, which Pallavicino has expressed by saying that he never could understand how the philosopher who could jest with him about the Eternal Father and hell-fire, should have had lying open on the bed, whereon he was found dead, the *Promessi Sposi* and the *Imitatio Christi.* It is clear that, however far Gioberti did advance in the direction of rationalism, he was never able unreservedly to accept or tranquilly to adopt all its principles and their consequences; and on the whole his posthumous works proved more a hindrance than a help to Italian thought. Falling under the Romish censure, interpreted in quite opposite ways by Gioberti's old disciples and by the Hegelians, they indicated but did not throw open that new way which, without breaking the continuity of Italian thought, might bring it into relation with modern philosophy. They only served to bring out more absolutely the contrast between those who wished to keep our philosophy entirely separated from that of the rest of Europe, and those who were too eager to introduce a foreign element into it, without due preparation and without regard to the national genius.

VI. From what has been said up to this point it will be apparent, however, that such a contrast as this was inevitable, and that it was bound to manifest itself in full force after 1849, when the consciousness of modern principles and ideas, which had been at once a cause and an effect of our political movements, was revealed in all its fulness to a new generation, born and brought up in their midst. This result was greatly promoted by the study of foreign philosophies, especially that of Germany, which for more than twenty years had been prosecuted with an interest growing ever stronger with the development of our thought. Even before the year 1840, the Abate Alfonso Testa, of Piacenza, had combated the doctrines of our philosophers with the weapons of Transcendental Idealism, of which he published a critical examination in 1843. At Naples, where Galluppi, the first to diffuse the study of the English philosophers and of Kant, had taught, and where a contemporary of his, Ottavio Colecchi, of Abruzzo, had professed the *Kritik*, there began to be formed, shortly before 1848, a Hegelian school, which included the two brothers Silvio and Bertrando Spavento, Francesco De Sanctis, Cammillo De Meis, Antonio Tari, Niccola Marselli, and others of less note. These introduced Hegelianism not only into our abstract philosophical studies, but also, and in my opinion with greater fruit, into our literary and historical criticism. The school was scattered by the events of 1848. Some of its adherents languished for long in wretched prisons, where they sought comfort in philosophy; others betook themselves to Piedmont, and amongst these was Bertrando Spaventa, who remained there till 1860, and there published the first of his writings on the history of Italian philosophy. The judgment he then uttered—a judgment, however, which he afterwards substantially modified—was to this effect: "The Italian philosophy rejects the principle of the modern world, and denies science, for it denies the idea of the spirit as a thing identical with liberty, or rather liberty itself; it denies the absolute nature of thought, the dialectic essence of which is the very essence and dialectic of being; it denies the identity of the divine and human nature," &c., &c. Thus wrote Spaventa in 1850, condemning the Italian school in the name of Absolute Idealism. In 1851 and 1852 appeared *La Filosofia della Rivoluzione*, by Giuseppe Ferrari (London), and *La Filosofia delle Scuole Italiane*, by Ausonio Franchi—two books in which the doctrines of Rosmini, Gioberti, and Mamiani were absolutely combated and refuted in the name of a critical Scepticism, which started at once from the principles of the *Encyclopédie* and from those of Kant. Differing in intellectual disposition no less than in the results of their doctrines, Ferrari and Franchi were at one in rejecting the speculations of our native philosophers as opposed to the spirit of modern philosophy. Ferrari, however, who in previous writings had confuted Rosmini, now adopted some of his psychological doctrines. Franchi's first work was a lively polemic directed against G. M. Bertini, then a follower of Gioberti, in which he condemned the doctrines not only of his adversary but of all the Italian schools, and summed up his opinion thus:—" Modern philosophy has not yet become possible in Italy ".

Thus, of a sudden, after 1849, arose two diametrically opposite philosophical movements. On the one hand stood the schools of Rosmini and Gioberti, professing to be in harmony with faith —*Italianissimi;* on the other there was the Rationalism of the new followers of the German doctrines—Hegelians, Kantians, Sceptics. I designate the two opposed parties in this way, because it was the principle of national tradition, rejected by the one and exaggerated by the other, that mainly divided and still divides them. And indeed their relative position is such that it can be rightly understood only by those who look back to the intellectual and political conditions of Italy at that time. For, viewed solely in its speculative aspect, the difference between the two schools might have left some path open, if not for reconciliation, at least for peaceable co-operation in the same intellectual work—the development of our thought. They had more than one principle in common, and more than one point of contact with modern philosophy; whilst the grafts which modern thought had inserted into the old trunk of the scholastic mediæval tradition, whence sprang the doctrines of Rosmini and Gioberti, might perhaps have grown and spread till the whole had been renewed. But this could have come to pass only if the absorption of the modern elements by our national thought had been effected in a continuous manner, and if those who introduced the doctrines of foreign schools had first spent upon them the analysis and criticism necessary to render them fit for assimilation by the Italian mind. Now it so happened that neither of these conditions was satisfied. Rosmini and Gioberti had distinguished disciples, but no true and proper successors; and the political and intellectual changes that went on after 1849 extinguished all the life and original activity in their schools. The disciples clung to the words of their masters, and rejected all innovation and all impartial study of foreign doctrines. The sentiment and the idea of "Italianism" in philosophy, which were certainly exaggerated by Gioberti but yet when he wrote had some justification, became in some of his followers a prejudice and a pretext for narrowness of mind and ignorance of all modern culture. And, on the other hand, most of those who at that time tried to introduce the German philosophy among us had no sufficiently broad and clear idea of the end they aimed at and of the means by which it might be reached; or, if they had such an idea, they certainly did not succeed in realising it. At the close of 1855, Ruggero Bonghi, the distinguished translator of Plato and Aristotle, in his youth the disciple and friend of Rosmini, and now one of the most illustrious of the writers and politicians of the moderate party, spoke in this strain:—"Those who now try to propagate and insinuate German doctrines in Italy do not seem to have sufficiently considered the natural difference between the Italian and German minds, and between the languages by which they are expressed". And elsewhere he speaks of them as "more inclined to appear profound than to make themselves intelligible". The upholders of Italian doctrines erred in despising the German philosophy, while they did not know it; the Hegelians and Kantians erred in wishing to make Italians think wholly in the manner of Germans. To many Giobertians and Rosminians the German philosophy appeared not only as the opposite of that professed by their masters, but also as the absolute negation of every religious and moral principle and of all science. In the eyes of Ausonio Franchi, on the other hand, Rosmini's system and Gioberti's first speculations were confounded with the Traditionalism of Father Giovacchino Ventura and the Scholastic Thomism of the *Civiltà Cattolica*, which had been started in 1850 by the Jesuits at Naples to support the reaction then in full course and the temporal power of the Pope.

The absolute impossibility of uniting to one end and in one common work the two opposite schools that thus struggled for supremacy in Italian thought, was made clear when Terenzio Mamiani founded at Genoa in 1850 an Academy of Italian Philosophy. During the five years of its existence this Academy grappled with various important questions, and helped by its valuable publications to promote among us the love of philosophy. It cannot be said, however, either to have given a vigorous mental impulse, or to have realised the hope of its founder, that the best Italian minds might in this way be brought into a fruitful union of speculative and moral studies, and to an agreement on certain supreme truths, common to natural reason and philosophic thought, and forming, as it were, a perennial tradition of science raised above the contention of systems and schools. Even if such a general and indefinite aspiration could have been realised at all, it was little fitted, especially at that time, to give unity of direction to the efforts of an Academy which embraced men of absolutely contradictory opinions in philosophy. The struggle which they kept up for the leadership of Italian thought was one of life and death, admitting neither truce, nor compromise, nor reconciliation. The Academicians, as one of them, Bertrando Spaventa, said, had nothing more in common than their assembly-hall. There they met, and called each other friends, colleagues, associates; but with the best intentions in the world they yet could never manage to understand one another. They formed an Academy of Italian Philosophy for the simple reason that they were born and settled in Italy. So far the Academy only too faithfully reflected the state of minds throughout the country.

VII. The founder and president of the Academy, in his desire to imbue it with a broad and conciliatory spirit, began from that time to put forward the doctrines to which he had himself been led by a slow evolution of thought through the various phases of the philosophical movement started by Galluppi. A follower of the experimental school during the first years of his exile in France, Count Terenzio Mamiani had gradually made his way towards an idealism, which, without losing sight of the national tradition and of Christianity, aimed at becoming entirely independent of revelation and theology. This rationalistic tendency became more and more manifest in Mamiani's writings; and succeeding, as he did on the death of Rosmini and Gioberti, to their position of influence, he has given a very powerful impulse to the national thought. To the authority exercised by his genius, his teaching, and the purity of his political life, Mamiani, as a writer and philosopher, adds the attractions of an artist. An elegant poet and polished prose writer, he has ever been the most illustrious representative of that classical school which was headed by Alfieri and which, by going back to the forms of antique art and the study of the men of the thirteenth and fifteenth centuries, re-invigorated the national sentiment by means of literature. Of this school Mamiani has in all his writings been, so to say, the philosopher; his ideal always being that close union of Christian and modern thought and feeling with the forms of antique art aimed at by those writers of the Renaissance, with whom, as I have before said, he seeks to restore the continuity of philosophical tradition. Among his works composed at the time of full vigour, two in particular reveal this intention, and have procured him the greatest amount of fame—*I Dialoghi di scienza prima*, where he happily imitates Plato; and the *Inni sacri*, in the manner of Homer and Callimachus, but with their subject borrowed from the Christian legends so intimately bound up with the traditions of our country and people.

Mamiani professes himself a Platonist, in as far as he maintains, contrary to all critical and empirical schools, the absolute objectivity of ideas. And the fact that he has by new arguments demonstrated this objectivity and placed it beyond the pale of doubt, constitutes, as he believes, the chief claim of his doctrine to stand as true and original. It does not, in his opinion, contradict the doctrines of Rosmini and Gioberti, but completes these while tempering their excesses, and thus it closes the period in our speculation which opened with Galluppi.

His doctrine of consciousness is directed towards the same end that Rosmini and Gioberti had in view when they combated the *Kritik*—namely, to prove with full certitude that we apprehend directly the infinite reality and the finite reality. It thus reduces itself to two main points, *perception* and *intelligence*, or *ideal vision*, and is wholly dependent on two principles, whereby Mamiani seeks to reconcile Plato and Aristotle: Every universal is *ante rem;* Every cognition is *post rem*. In other words, every idea considered in itself is universal, necessary, immutable, and, as such, *objective*, independent of thought, and underived from sense: and on the other hand, no idea is innate—all are preceded by sense-perception, which is the occasion of their appearing before the mind and being determined as the truth of the things presented by experience. Thus, by means of ideas as well as by sense-perceptions, human consciousness receives into itself the real, the *noümenon*. Like Reid, Mamiani excludes from perception all intervention of conceptions and representative ideas. It is according to him an immediate relation of the spirit with reality; it is an act *sui generis* and in the highest degree simple; a mental intuition, by which in our sense-affections we are made aware of the *action* of the exciting forces and substances. Such an action is *involved* in the passivity of sensation, and is perceived by us in conjunction therewith, but we cannot by means of this inward intuition penetrate to the substances which operate upon us. They and our spirit, which sometimes modifies them and sometimes is modified by them, are joined in a relationship, in which the acts only are united and reciprocally penetrative, while the substances and subjects remain incommunicable.

To this relation, which unites our spirit to sensible reality through experience, there corresponds another which unites it to absolute reality through ideas. The idea, according to Mamiani, is *the Absolute in as far as it appears and announces itself to the intelligence;* it is the *mental form* of the Absolute, which is determined in particular ideas, each of the latter expressing *ad intra* the eternal possibility of a finite thing, and *ad extra* its concrete reality, which however is *given* only in the fact of experience. Thus in the truth of ideas the mind intuitively perceives the real existence of the Absolute, but it apprehends only its *presence*, and, as it were, touches its surface without being able to pierce with the eye to its mysterious depth, or to comprehend its perfections and attributes, which are represented by the ideas only in a symbolical and analogical fashion. In this, as in other parts of his doctrine, Mamiani takes a path midway between Rosmini, who denies to man the intuition of absolute reality, and Gioberti, who goes so far as to concede to him the perception of the divine substance. He has tried with all his might to fix the extreme limit of the mind's intuition of the Absolute; but (as might be expected) has been able to give a merely imaginative representation of it.

The fundamental doctrine of Mamiani, and the point towards which he has rallied all the powers of his mind, is the demonstration of the real presence of the Absolute in the ideal representation—a demonstration which at bottom is the celebrated argument of St. Anselm, modified and reproduced in a new form. Mamiani wishes to prove that every idea (and not merely the idea of God) includes a necessary truth, which, as such, is inseparable from an eternal, absolute, and self-existent object. The unity of ideas constitutes the totality of truth, which is therefore inseparable from and convertible with the reality of the Absolute. Assuming the Principle of Contradiction, he maintains that, if every necessary and absolute truth did not subsist in a real eternal object, it would become contradictory, for it would both exist and not exist at the same time. However, he does not pretend to *deduce* the existence of the Absolute from a higher principle; he only wishes to prove that it is the postulate and condition of every ideal truth (not excluding the Principle of Contradiction itself), and that thus the Absolute is immediately and intuitively perceived by us.

Mamiani has written a Cosmology, which he thinks the most novel part of his philosophy and by which he intended to supply a substantial defect in the systems of Rosmini and Gioberti. The following are some of its chief features. Starting from the idea of the good and its relation to the creative act, which he regards as necessary, he thence advances to the conception of the world as an indefinite multitude of monads, or simple activities, which act upon each other, and are united under the active influence of the infinite, whose perfections they come to share by an indefinite progression thitherward. This cosmic progression Mamiani tries to demonstrate *à priori*, by basing it on the idea of the infinite as well as on that of nature; then he traces it up to the highest grade of things, to wit, the region of moral existences, which are immediately subject to it. Having thus raised himself to a philosophy of history, whose fundamental conception is the *organic unity of mankind*, he sets himself to enumerate the laws of its development, and the forms it has assumed in different nations and in their mutual historical relations. The Italian philosopher's speculations on the subject of the vicissitudes and destinies of mankind, though preceded by those of Vico and Romagnosi, are in part original. They find their completion in the doctrine set forth in his work *Di un nuovo diritto europeo* (1859), which was translated into French, and is well known outside Italy.

His general philosophy may be studied in his *Confessioni di un Metafisico* (1865), in his *Meditazioni Cartesiane* (1869), and in his last work, *Compendio e Sintesi della propria filosofia, ossia nuovi Prolegomeni ad ogni presente e futura Metafisica* (1876). Except on the one head of the relation of philosophy to faith, his doctrine has a common origin with the systems of Rosmini and Gioberti, and it leans towards mysticism by reducing the mind's activity in cognition to very small limits. Its psychological basis is rather weak, and in this respect it is inferior to the doctrine of Rosmini.

Mamiani is a man of a lively and versatile mind, and of an indefatigable activity. Professor of Philosophy of History in the University of Turin from 1837 to 1850; in 1860, Minister of Public Instruction in the first Italian Cabinet, presided over by Cavour; next, Italian Ambassador in Greece and afterwards in Switzerland; then Councillor of State at Florence and now at Rome, he has until last year taught in the Athenæum of the latter city, and is at the present moment one of the most active workers connected with the *Filosofia delle Scuole Italiane*. This Review, which is known to the readers of MIND, is the most important of the Italian periodical publications devoted to philosophy. Mamiani's fellow-workers have full liberty of thought and discussion, but though some of them profess very different doctrines from his, they rally round him as the most influential representative of that speculative movement which helped forward our national resurrection, and awoke us from an intellectual torpor of more than two centuries. Mamiani's labours within this movement would, I believe, have had much more effect, if he had professed all along in his writings a well defined doctrine, and if in the excess of his attachment to our traditions he had not too rigidly condemned all foreign philosophy, especially that of Kant. Notwithstanding this, however, he certainly cannot, as many others of our philosophers can, be charged with having refuted modern doctrines without knowing them. The spirit of free yet conscientious criticism which characterised his first onslaughts on Rosmini and Gioberti, has remained with him throughout the long controversy which as an old man he has maintained with the Hegelians and Positivists, while the activity of his mind has only increased with years as he has seen the adherents of a purely Italian philosophy range themselves about him in two sections; on the one hand being the avowed opponents of Hegel and Comte, on the other those who without swearing to their words are yet eager to assimilate the results of modern thought.

VIII. Of the latter section of thinkers several have been invited by Mamiani to co-operate in the *Filosofia delle Scuole Italiane,* and they have taken part in it to a considerable extent. Among the most notable of these have been G. Battista Bertini and Francesco Bonatelli. Bertini, who died a couple of years ago, was a man of acute mind, and a most earnest searcher after truth. After his first work, *Idea d'una filosofia della Vita* (1850), which Franchi took as the subject of his criticism, he wrote no more purely philosophical books; but it is certain that with ripening knowledge he drifted away from the doctrines of Gioberti more and more in the direction of a rationalistic theism, which to some extent agreed with the theism of Mamiani, though it was more largely influenced by modern philosophy, especially that of Germany. A learned Hellenist and vigorous critic, Bertini turned his attention chiefly to the History of Philosophy. His work on the Greek philosophers anterior to Socrates, based on the text of the fragments collected by Mullach, is our best work relative to that period of ancient speculation. He was particularly interested in morals, and in the religious problem, on which he wrote at length and had much discussion with Mamiani, who has often treated the subject in the *Filosofia delle Scuole Italiane.* His posthumous work, *Il Vaticano e lo Stato* (1877), recommends to enlightened and liberal Catholics a reform that should purify their religion and aim at bringing it into harmony with reason and the moral sense. Bertini was professor of History of Philosophy in the University of Turin.

Bonatelli, professor of Philosophy in the University of Padua, belongs to the Herbartian School, from which he has borrowed in particular his psychological doctrines, while endeavouring to bring them into harmony with the autonomy of moral acts and with religious faith, which he professes with the deepest conviction. His two principal works are *Pensiero e Conoscenza* and *La coscienza e il meccanismo interiore,* to which he has lately added a long essay on Hartmann, show him to be possessed of a refined if not original mind, with much acuteness of observation and a sound knowledge of the History of Philosophy.

Much nearer to Mamiani stands Luigi Ferri, professor of Philosophy in the University of Rome. Having prosecuted his early studies at the École Normale of Paris, he was confirmed in his natural bent for psychological observation and for that accurate historical analysis of systems of which the French have furnished us with many examples. Ferri adheres substantially to the Idealism professed by Mamiani, though with a certain reservation as to the psychological portions of that doctrine, to which he would give a more solid basis by the study of the phenomena of consciousness. What conclusions he may ultimately arrive at by this study, which seems to me to indicate a change in his thought brought about by the German and English psychology, do not yet appear. Ferri's principal work is the *Essai sur l'histoire de la Philosophie en Italie au dix-neuvième siècle* (1869), and it is certainly the most complete and solid history that has yet appeared in regard to our contemporary philosophy. Here it is faithfully delineated both in its inner development and in its relations to Italian political movements and to the part played in them by our philosophers. And yet the author, I think, is open to the charge of having represented these as more in unison than they really were with the spirit of Modern Philosophy, and of having exaggerated its influence on the dogmatic and theological element in their doctrines. Ferri has also given much study to the philosophers of the Renaissance. His latest work is the publication of the MS. of a treatise by Pomponazzi, *In libros de Anima,* discovered by him in the Angelica Library at Rome, and elucidated in an important memoir, wherein he maintains that Pomponazzi's doctrine and his interpretation of Aristotle's theory of the intellectual soul never varied. On this subject he has recently engaged in a lively polemic with Prof. Fiorentino.

Domenico Berti, a man of much influence from his genius and learning as well as the position he holds among our politicians of the moderate party, is specially known by his historical labours. At first a teacher of the doctrines of Rosmini in the University of Turin, he has gradually arrived at the conception of a close harmony between philosophy and the results of the natural sciences. But he has rather indicated than formally expounded his philosophical opinions, and he is best known by his *Vita di Giordano Bruno,* a solid piece of work that throws much new light upon the mind and labours of the unfortunate philosopher of Nola. It was the author's intention to follow up his biography of Bruno by the exposition and criticism of his doctrines, but as yet the promise remains unfulfilled. Berti was professor of History of Philosophy in the University of Rome till a year ago, and is the author of two other important works on the philosophers of the Renaissance. One of these is entitled *Copernico e le vicende del sistema copernicano in Italia, nella seconda metà del secolo XVI. e nella prima del XVII.*, &c. (1876); the other, *Processo di Galileo Galilei pubblicato per la prima volta* (1876). The latter has been subjected to very severe criticism by German scholars, calling forth Gebler's recent publication, *Die Acten des Galilei'schen Processes, nach der vaticanischen Handschrift herausgegeben* (Stuttgart, 1877). Berti was for some years Minister of Public Instruction.

By the side of these men, who without cutting themselves off from the Italian speculative tradition are more or less in contact with the method and principles of Modern Philosophy, are some others, who either continue to follow the doctrines of Rosmini and Gioberti, or who, rejecting its systematic form, adhere to its dogmatic and theological substance and to the postulate of a necessary agreement between reason and faith. At Turin Rosmini's doctrine had from the first one of its main centres; and there it was long taught by G. B. Peyretti, lately dead. He and Profs. Pestalozza and Corte have expounded it in an elementary form, and their manuals have been adopted as textbooks in most of the Lyceums of Piedmont, Lombardy, and Tuscany since 1860. In the University of Pisa the Rosminian doctrine is at present professed by Paganini, author of a work that treats of its relation to theology. In the southern provinces the philosophy of Gioberti's first works is still professed by some, chief among whom are, in Sicily, the Abate Vincenzo Di Giovanni, professor in the Lyceum of Palermo, author of numerous careful works on the History of Philosophy, and at Naples by the Abate Vito Fornari, an imaginative and elegant writer, more of a theologian than a philosopher, and known by his *Dialoghi dell' Armonia universale* (1862), by a treatise on *L'Arte del dire,* and by a *Vita di Cristo,* of which only two volumes have as yet appeared. Formerly a pupil of Fornari, and now a professor in the University of Bologna, Francesco Acri has given proof of a rare knowledge of German doctrines and of the history of philosophical systems, in regard to which he has in various writings emitted certain novel and rather noteworthy ideas.

In Tuscany, where there is some repugnance to speculations of too abstract a nature, and where the school of Galileo by means of the Accademia del Cimento created a strong tradition of experimental study, a ready welcome was given to Galluppi. Later arose some followers of Rosmini, chiefly attracted by his psychological doctrines. The philosophy of Gioberti, especially that of his first writings, has been taught from youth upwards by Augusto Conti, now professor of Philosophy in the Higher Institute of Florence, and well-known outside of Tuscany. A Catholic by conviction and sentiment, and, like Rosmini and Gioberti, nurtured in the study of the Fathers and Doctors, he professes doctrines that accord with the main truths of Christianity, while they are declared by him to be contained in the natural consciousness of every man, so as to need only recognition from science. Philosophy, according to him, presupposes and has for its material the *natural certitude* of truth given to us by the three relations of thought—to mind, to human society, and to God. These relations provide the philosopher with five criteria, namely, evidence and the love of truth, the authority of common sense and of the learned, and the authority of Revelation. Evidence is the primary criterion; the others are secondary and subsidiary. This doctrine, expounded in the work entitled *Evidenza, amore e fede o i Criterii della Filosofia* (1872, 3rd ed.), is substantially at one with that of Rosmini and Gioberti as to the necessity of making its ultimate agreement with revealed truth the postulate of every scientific demonstration. Conti, however, goes farther than this, and not only does he not recognise any natural intuition of God, or of divine ideas, but he would make Philosophy entirely independent of any kind of systematic form, by distinguishing the truths which he calls *substantial and theorematic*, as being naturally known and demonstrated and beyond the pale of doubt, from the *problems*, which are given over to the examination and judgment of philosophers. In what way and how far he would thus restrict the liberty of scientific reflection and lower its value, does not sufficiently appear; there is, however, according to Conti, a "perennial and progressive Philosophy," which is not to be confounded with sects and erroneous systems. The latter confound and derange the order of the truths of consciousness, which they fail to comprehend in all its relations; the former faithfully traces out this order without confounding or denying it in any part. Philosophy is "the science of God, of the world and of man in their universal order, present to human consciousness"; its true method consists in the recognition of the nature and sequence of the universal relations existing between ideas and things, setting out from the examination of inner facts, and rising thence to the highest notions of the True, the Good, and the Beautiful, and lastly applying these to the scientific knowledge of God, the world, and man, and to the reasoning of the three arts, Logic, Æsthetics, and Morals. This large design has been realised by Conti in a series of works (9 vols.) comprehending Elementary Philosophy and Higher Philosophy, divided into Dialectics, Æsthetics, and Morals. He is besides the author of a *History of Philosophy* (the only one yet written in Italy), in which he follows out the "perennial tradition" of speculative thought, and, distinguishing it from the "sects" which deny and modify natural and revealed truth, finds its completest and highest realisation in the Fathers and the Doctors of the Church, especially St. Thomas. Conti exercises a great personal influence by the precision of his thought, his remarkable power of expression, and the strength of his convictions. His *Elementary Philosophy* is taught by many disciples in our Lyceums.

IX. At the head of the opposition, by which the doctrines of Rosmini, Gioberti, and Mamiani have found themselves confronted since 1850, stand, as I have already said, the Sceptics and Hegelians. Sceptical criticism is represented by Ferrari and Franchi. At bottom the doctrine expounded by Ferrari in his *Filosofia della Rivoluzione* is the phenomenalism of Protagoras, reanimated by the Criticism of Kant and the Empirism of the eighteenth century. The conception round which it moves is that of the perennial incessant change pervading everything, facts as well as ideas, Logic as well as Nature. For, on the one hand, says Ferrari, the very logical laws, which would seem to reveal to us a close relation of identity between the essential elements of our ideas, are vain and fallacious, and, when subjected to analysis, disclose irreconcilable antitheses and antinomies; and, on the other hand, everything in Nature is subject to change, alteration, contrast, and thus is averse from that unity which thought looks for in facts by representing them to itself and explaining them scientifically by their laws. Contradiction is therefore the law of being, and should be accepted without any attempt at its removal. Antinomies do not, as Kant sought to prove, occur only in the principal ideas of reason, but also in all ideas, and in all facts, and furthermore between ideas and facts; so that Logic and Nature are contradictory in themselves and between themselves, and thought, which would dominate facts by applying itself to their real elements, is of necessity involved in error. Ferrari consequently entirely denies the possibility of science, and concludes that all we have to deal with is facts, or rather their appearances (existence and appearance being the same), and that thought, so far from wishing to dominate phenomena, should be subordinate to them, and confine itself to the examination of their infinite varieties and contrasts, accepting, without pretending to penetrate, the hidden revelations of Nature. Thus by an opposite route Scepticism arrives at the same point as theological Dogmatism—sentiment and faith, the *credo quia absurdum* of Tertullian, a maxim often repeated by Ferrari. He is best known by his works on the Philosophy of History, and by his doctrine of "political periods," with which he tries to measure arithmetically the different phases of the life of nations. A pupil of Romagnosi's, long resident in France, where he was much appreciated, he returned to Italy in 1859, was professor of Philosophy of History at Milan, Florence, and Rome, and a deputy of the Extreme Left till his death last year. Ferrari was a man of a powerful and original mind, but undisciplined and impatient of the rigorous examination of facts, so that also in his political forecasts he often went astray.

Owing to the very abstract form of his doctrines, Ferrari has exercised but little influence among us. It has not been so with Franchi, a lively and exact writer, ever aiming at one object—the utter demolition of what he was the first to call the Philosophy of the Italian Schools, and which he identifies throughout with the Scholasticism and Theology of the Church of Rome. I have already allowed that there is a foundation of truth in this harsh judgment of Franchi's; but yet he goes too far, and, looking only to the substantial agreement between Italian doctrines and Catholic dogma, he fails to take sufficient account of the elements derived from Modern Philosophy, of the impulses given by Galluppi, Gioberti, and Rosmini, and, above all, of their historical value as paving the way for the national revolution and arousing us from our secular slumber to a new life of thought and action. To condemn them, however, without appeal, it is enough for Franchi that they should substantially agree with the Catholic creed, no matter what amount of liberty of thought and inquiry and what rigour of method our philosophers may have employed. In this intemperance of criticism we recognise the truest expression of the negative reaction that followed the attempt made by Rosmini and Gioberti to reconcile Catholicism with Philosophy. The reaction was all the greater in Franchi's case from the depth and passionateness of his early faith; for he was educated in an ecclesiastical seminary, and wore the priest's habit before laying it aside when severe inward struggles landed him in Rationalism: he dropped also his very name of Cristoforo Bonavino, calling himself henceforth Ausonio Franchi. His other works, besides the *Filosofia delle Scuole Italiane*, are *La Religione del secolo*

XIX., the *Razionalismo del popolo*, the *Sentimento*, two volumes of *Lezioni sulla Storia della Filosofia moderna*, and the *Teorica del Giudizio.* In this last he criticises the synthetic judgments *à priori* of Kant, and expounds the docrines of the philosophers who have treated of the subject. Born for controversy, which he manages with rare skill and vigour, Franchi, as a philosopher and psychologist, has no doctrines of his own, and fluctuates between the Criticism of Kant and a mild Sensationalism, in which feeling is substituted for sensation as the basis of the phenomena of consciousness. His thought borrows force and life from the ardour of his convictions, which however is prone to excess and gives to his style a declamatory tone. He is a professor in the Scientific and Literary Academy of Milan.

Franchi has followers in various parts of Italy; but he has not, nor ever could have, a school. In fact the only speculative doctrine, opposed to that of our philosophers, which has formed a school among us is Hegelianism. Started in Naples previous to 1848, it has flourished there since the political overturn of 1860, and now has its centre in the University, where it is taught by Augusto Vera and Bertrando Spaventa. Of the two, Vera is the true and leading representative of the school, both because he professes its doctrines more faithfully, and because to his influence as a teacher and writer he adds the authority of a name well-known beyond Italy. There is no need to mention to the readers of MIND the many writings by means of which the translator of Hegel has so powerfully aided in the diffusion of his doctrines both in Europe and in America; for he has not limited himself to illustrating and defending these, but has also to some extent developed them by thought of his own. Among contemporary philosophers Vera is one of those who have cut themselves most adrift from the idea of nationality, though he did publish some years ago an important work on one question of special interest to Italy—the freedom of the Church in relation to the State. He has always refrained from any direct examination of the doctrines of our philosophers, to whom he allows no speculative value whatsoever. This severe judgment on Galluppi, Rosmini and Gioberti finds expression in a work, entitled *La Philosophie contemporaine en Italie; Essai de Philosophie Hégelienne* (Paris, 1868), written by Raffaele Mariano, a pupil of Vera's, and the author of other works, in which the principles of Hegelianism are applied to the religious and political problems of our time. Among the followers of Hegel we should mention also the late Marchesa Marianna Florenzi Waddington, a lady of the highest culture and the author of various works, in one of which an attempt is made to reconcile the doctrine of the immortality of the soul with the principles of absolute idealism.

The theoretical and doctrinal part of Hegelianism, however, has been of less account among us than the applications made of it in the field of historical and critical studies, which have been to some extent revived by its influence. Did space permit, I might speak of Francesco De Sanctis as one who under inspiration from Hegel led the way to a broader and more philosophical literary criticism than reigned in our schools in the first half of the century. Moreover, Hegelianism has, though in a less degree, influenced the relations of philosophy to the physical sciences, as shown in the writings of Cammillo De Meis, professor of History of Medicine in the University of Bologna. His aim has ever been to harmonise the speculations of philosophy with the results of experimental research. Thus in his work, *I Tipi animali* (of which as yet only one volume has appeared), he proposes a solution of the problem of the variation of species which, without repudiating the empirical data of Darwin's discoveries, would subject them to the superior requirements of a strictly scientific demonstration. The work to which De Meis chiefly owes his fame is his *Dopo la Laurea*, a kind of autobiography descriptive of his youthful studies and the state of his mind on quitting the University. It gives a vivid picture of the Italian mind between 1848 and 1860.

I have already appealed to the judgment of one of our most illustrious living writers, Ruggero Bonghi, as to the reason why the labours of the Hegelian school have borne less fruit among us than might have been expected. The merit that certainly belongs to it of having brought Italian into immediate contact with German thought, of having infused into the inert mass of our philosophical studies a new vein of stirring and refreshing ideas, of having for the first time opened out to our view the broad prospect of that historical method which is the glory of modern science—this undeniable merit of the Hegelian school would have seemed to the impartial historian all the greater, had more account been taken by it of the natural and traditional disposition of the Italian mind, and had the attempt not been made to introduce foreign ideas among us as if they were so much merchandise. Moreover it dogmatised at least as much as its opponents, and that too at a time when it ought rather to have trained our minds to that critical analysis and those psychological inquiries from which alone we could derive solid preparation for the modern scientific method. But indeed in Italy our minds were so little inclined to criticism that it was very natural, or I might say necessary, for many to pass *per* *saltum* from the theological dogmatism of the ontologists to another dogmatism of an opposite but no less absolute kind; and even now, though the most faithful followers of the Hegelian school have dropped many of their southern fancies, the identity of being and not-being and the evolution of the Absolute are regarded as the last word of science—as so many articles of faith. This, it will be said, is a necessary consequence of the systematic spirit. The evil, however, was that, whereas for the Germans Absolute Idealism was the last stage of one of the broadest and most liberal speculative movements on record, for us, on the other hand, it was only an importation, accepted for the most part by its followers without examination, and for no other reason than that it represented a faith opposed to that which had hitherto been preached to them; accepted too as the latest outcome of modern speculation, though the doctrine was already superannuated in Germany, and no longer responded to the needs of European thought.

Bertrando Spaventa saw this more clearly than any of the other Hegelians. Stepping in between the partisans of an exclusively national philosophy and the strict Hegelians, who took no account of our intellectual traditions, he recognised the need of linking our thought once more to that of the other nations of Europe, whilst, at the same time, he clearly saw that we could enter into the spirit of Modern Philosophy only by preserving the consciousness of our speculative thought in its entirety and in all its historical continuity, and by taking up again the thread of our philosophical tradition at that point where it had been in relation with the thought of other nations. The same position had been already maintained by Mamiani as against Rosmini; but it was taken up anew by Spaventa, after 1850, and defended with much power. In his view our philosophers of the Renaissance mark the point in history to which Italian thought must turn to find again the consciousness of itself and of its traditions, and above all Giordano Bruno and Tommaso Campanella are important as initiators of modern thought. He regards Bruno as the precursor of Spinoza, and Campanella as the precursor of Descartes. In Vico, who followed these at a long interval and rose to a general conception of man and history, Spaventa sees the final outcome of their doctrines, and an indication from afar of the Idealism of Kant.

This view has been traced by Spaventa in one series of his *Saggi*, which throw much light upon the history of modern philosophy, and are certainly the best of his writings. These are only one part of his work, however; the other being given up to an attempt to discover in the doctrines of our latest philosophers, especially Gioberti, an intimate connexion between

Italian speculative thought and modern philosophy. I have already remarked that in his earliest writings Spaventa agreed with Vera and the other Hegelians in excluding Galluppi, Rosmini and Gioberti from the history of modern speculation. But he confesses that riper study has convinced him that our philosophers not only felt Kant's influence, but were, unknown to themselves, urged by an irresistible logical necessity to the same critical results; that Galluppi was a Kantian without being aware of it; that Rosmini gave to the problem of knowledge the same solution as Kant; and finally that Gioberti is in his early works a Spinozist, in his posthumous a Hegelian. Such are the main conclusions reached by Spaventa in that part of his historico-critical essays, where he searches out and not seldom finds the subtlest analogies between the speculations of Italian and Germany philosophers; but here his criticism is undoubtedly at its weakest. That our philosophical thought indeed was influenced by the same speculative needs as had determined the *Kritik* of Kant, and that especially Galluppi and Rosmini, in applying themselves to the problem of knowledge, were so far linking themselves to modern Philosophy, are facts which no impartial critic would deny. But that Rosmini and the author of the *Primato* can be called Kantians or Hegelians, that the matter and, what is of more consequence, the spirit of their speculations substantially agree with the modern German philosophy, are what no criticism, however ingenious, will ever succeed in proving.

As a philosopher, Spaventa has no doctrines peculiar to himself. Substantially he is a follower of Hegel, but this does not prevent him from adopting any good thing that other schools may offer, as, for example, the Herbartian, whose psychology he highly appreciates. But it is in the field of critical History of Philosophy that he has exercised most influence as a teacher and a writer. His ideas in regard to the philosophers of the Renaissance have found their most faithful interpreter in Francesco Fiorentino, professor in the University of Pisa, and best known by his two valuable works on Pomponazzi and Telesio, which are both marked by care and originality of research in regard to the schools of Padua and Cosenza. Fiorentino has also recently published a book of *Elementi di Filosofia*, for use in the higher instruction, in which, while substantially following Kant, he partly adopts in psychology the doctrines of Herbart, and in logic the theories of Mill. He is conductor of the *Giornale Napoletano*, which in its philosophy represents the views of Spaventa's followers.

X. In Italy as elsewhere the advance in historical and critical studies is bound up with the rise and spread of the Positive

Philosophy. I purposely make use of the term Positive (which in England is rejected by Experientialists) for two reasons: first, because the positivist doctrines came to us directly from France, being from the first nothing but an echo of Comte's ideas; and secondly, because, in regard to the meaning of the word Positivism, there has been, and still is, in the minds of many in Italy some confusion of schools and doctrines that are at one in rejecting metaphysics but in other points are widely different. This confusion is to be attributed rather to the meagre philosophical culture of the Italian people, than to any fault in those who first introduced the new doctrines among us. Before 1870, attention had been drawn to these by Pasquale Villari, the well-known historian of Savonarola and Machiavelli, in an essay published in the *Politecnico* of Milan, and by Aristide Gabelli in his work entitled *L'Uomo e le Scienze morali.* Both these writers, but especially Villari in his historical studies, adhere substantially to the doctrines of Comte, while endeavouring to harmonise them as much as possible with the tradition of our experimental schools. Till a few years ago, however, the literature of the young Italian Positive School was not of much account; not that there was any lack of writers, but they did not form a true and distinctive school. Without any clear or definite notion of their philosophical tendencies, they lost themselves in useless generalities about method, categories of cause, substance, being, &c., and declaimed against the doctrines of their opponent without inquiring whether in the field of Experiential Philosophy and with the aid alone of scientific method, it were possible, or had elsewhere been tried, to give a doctrinal form and development to Psychology and the other moral sciences. The new and fruitful direction which these had taken in England, without abandoning the tradition of the school of Locke, Hume, and Hartley, was almost unknown in Italy till shortly before 1870; the number of readers of Spencer, Bain, or Lewes being very limited, while Stuart Mill was known chiefly by his *Liberty* and his economic writings.

The extension of the national culture and the new impulse given to philosophical studies by advance in the historical and physical sciences have contributed much to change this state of things. The influence of the doctrines of Comte, an almost absolute one at first, has been superseded in our Positive School by that of the English philosophy. And now it may be said that the latter is more known and studied among us, especially by the general body of the intelligent public, than is the German philosophy. The followers of the latter are to be found chiefly in the universities, while Mill, Spencer and Bain are the names of highest repute amongst our most cultured classes and the students of the historical and social sciences. I will not say, however, that these, or at least the greater part of them, fully understand the position of the English Experiential School, or its relation to the history of contemporary philosophy—to Empirism and Materialism on the one hand and to metaphysical and theological Dogmatism on the other. For it is not unusual to find Büchner, Comte, and Spencer quoted in some volume or journal as members of the same school, and to hear it asserted by writers of repute that the English school identifies physiology with psychology. So true is it that few in Italy, even among the learned, have been able to free themselves from all dogmatic prejudice and to see that the experimental study of subjective phenomena may have a rigorous scientific form independently of any definite solution of the problem of being.

Nevertheless a few recent publications of the Positive School in Italy deserve to be noticed. One of these is Niccola Marselli's *Scienza della Storia*, intended by the author to be the introduction to a work on the Philosophy of History not yet published, and containing an exposition and acute examination of the doctrines held on that subject: Marselli is a follower both of Hegel and Comte. Another is Ardigò's *La Psicologia come scienza positiva* (1871), the first attempt in Italy to give a definite shape to the principles and consequences of Positivism. Starting from the doctrines of the English School of psychology, taken in conjunction with the recent researches of Helmholtz and Fechner, Ardigò aims to rise above both Materialism and Spiritualism to the conception of a "psychophysical reality". His work reveals a mind of speculative power and aptitude for subjective analysis.

In our prosecution of psychological inquiry two facts have to be noted as promising well for the future of our philosophical studies. The one is the appearance of writings, mostly by young men, in which psychological observation is subjected to a division of labour and limited to the rigorous analysis of single phenomena or single groups of phenomena. Of such writings one of the most noteworthy is that by Dr. Paolo Riccardi, entitled *Saggio di studii e di osservazioni intorno all' attenzione nell' uomo e negli animali* (Modena, 1877). The other and still more significant fact is the exhibition by philosophers and men of science of a disposition to find in Psychology and Anthropology a common field of inquiry and study, which cannot fail to bear fruit. For on the one hand we have the recognition of the necessity of never separating the study of psychical from that of physiological, ethnical, and historical facts; and on the other, we have the avowal of the value of subjective observation together with the application of the strict rules of the inductive method. It is some years since the celebrated Accademia dei Lincei of Rome, at the suggestion of its president Quintino Sella, instituted a new section for the moral, historical and philological sciences; and philosophy is now represented in it by Mamiani, Ferri, and Berti. Then again, the Italian Society of Anthropology and Ethnology, which meets at Florence, at one of its latest sittings changed its title to that of the Society of Anthropology and Comparative Psychology, intending thereby to mark its desire henceforward to add the culture of Philosophy to its previously restricted field of external and physiological inquiry. This change, it may be noted, was effected at the instance of Prof. Mantegazza, President of the Society, a distinguished physiologist and writer of works on hygiene, and of Prof. A. Herzen, well known by his *Analisi fisiologica del libero arbitrio.*

XI. In conclusion I would remark that, while there is thus a certain amount of activity in philosophical studies, there is as yet in Italy no true and proper speculative movement. The facts here brought forward will, I venture to think, have made it apparent that for twenty years and more the conditions surrounding our thought have been little in its favour, and have tended to check rather than promote its vigour. Looked at from any point whatsoever, the doctrines of Galluppi, Rosmini, and Gioberti have been the only product of speculation which Italy of itself has yielded during this century; and it was only so long as they were the expression of a great moral and political crisis, and responded to a living national want, that they were able to hold sway over the realm of thought. After 1850, overtaken by the spirit of the new times, they found themselves confronted by the Critical Scepticism and the Hegelianism which then began to make head in our midst. The division which thus sprang up was an irreconcilable one, and proved fatal to our thought by wasting its energies in barren contentions. German speculation had passed by a slow and gradual evolution from Leibnitz and Wolff through the criticism of Kant and the systems of Fichte and Schelling to Hegel; but not till the close of its splendid course did this great idealistic movement in its final outcome cross the Alps. Introduced among us it found our minds, by long habituation to theological dogmatism, little, if at all, trained to severe criticism and rigorous analysis, and disposed to make philosophy a question rather of nationality than of science. Between the "ideal intuition" of Rosmini and Gioberti and the "idea" of Hegel there was no middle term possible; hence there was no possibility of a serious and fruitful discussion between the followers of the two schools, nor any common ground of agreement or of study. The one maintained an exclusively Italian tradition: the other repeated foreign doctrines. The attempts which both made to restore life and movement to Italian thought, without abandoning tradition, and to naturalise the philosophy of Hegel among us, have been attended, as yet at least, with no general or lasting results. And this, either because our minds were already exhausted, surfeited or distracted, or because we altogether lacked that spirit of application and discipline, which has contributed so much to the progress of science in Germany.

What we really stand in need of is the thorough scientific preparation that comes of patient observation, pyschological analysis, and a loyal and willing acceptance of whatever conclusions the strict application of scientific method may yield; and, fortunately, the signs are not wanting that such a process of preparation is at last making way in our midst. This is attested by the increasing interest displayed in psychological research, and by the attention bestowed on the History of Philosophy, ancient and modern, as shown by the recent publication of various valuable translations of ancient philosophers, and by the production of numerous special historical works and monographs. Of the German philosophers Kant alone can be said to supply a key to the history of modern philosophy, and as in Germany so with us he is now the chief object of study. Side by side too with the increasing knowledge of foreign languages grows our capacity for assimilating the ideas which they embody; while the habit of free thought is becoming confirmed, in proportion as the impulse to the study of the great philosophical, religious and social problems, that formerly came entirely from without, is now more and more begotten of the activity and growing energy of our own national life.

G. BARZELLOTTI.

VI.—CRITICAL NOTICES.

On the Theory of Logic: An Essay. By CARVETH READ. London: Kegan Paul, 1878.

I can here discuss only a few of the points raised by Mr. Read in his very thoughtful and suggestive essay.

The general view which he takes of the subject is that which may be called the objective or matter-of-fact view. Of this view Mill is the best known exponent in England; for although, as Mr. Read very fairly objects, he departs from this standing-point in his definition of the science, he preserves it with great consistency throughout nearly all the discussions in his volumes. It is not of course implied by Mr. Read that this subject-matter of Logic lies, so to say, outside of the human faculties, or can ever be anything but relative to those faculties. It is merely the position and mode of treatment appropriate to the science which is here discussed. "We may call it a postulate of the Abstract and Objective Sciences, that the subjective element may be neglected: we write, *Such is the course of Nature;* not, *Thus it appears to us.*" With this I find myself in entire accordance. At the same time, it seems to me as if this objective view was pushed almost too far; as if the author were attempting, partly in expression, partly in his mode of treatment, to lay aside more completely than is possible, the human or relative element in a system of Logic. Thus he always seems to regard the 'Term' as being a phenomenon itself, instead of being our representative merely, whether in thought or in language, of the phenomena. Thus he says: "How feelings are terms hardly needs pointing out"; and again: "As the likeness and unlikeness of terms in general is the fact which gives existence to classes, so the likeness and unlikeness of compound terms gives rise to those classes which are based on many attributes"; also: "A class consists of terms united by (1) likeness among themselves, (2) unlikeness to others"; whilst his 'Table of Terms' corresponds in consequence broadly with what Mill offers as a catalogue *raisonné* of existences in general, in substitution for the Categories. This is perhaps merely a matter of language, but it is surely an innovation, and one which leads to a redundancy in our objective nomenclature and a deficiency in our subjective (for what technical logical equivalent have we then left for the old 'term,' or 'name,' as it is more loosely called?). Moreover such a usage seems distinctly liable to lead to confusion when we have to talk of *essences*, and some slight trace of such a confusion I cannot but think is perceptible in this essay. Where are the properties of the essence to be sought—in the phenomena themselves or in our names for them? In the former, no doubt; but what Mr. Read does not seem to me to bring out clearly enough, is how largely the particular selection of them is our own; relative that is, not to human faculties in general, but to the particular needs and circumstances of the people who use the name. Some such expression therefore as 'the connotation of a class name' or of a 'term,' in its common sense, is, I think, much preferable, as better serving to fix and call attention to this fact.

With every wish to make our treatment and point of view as objective as possible, it seems to me that there are a variety of points in which relativeness is practically forced upon us. For instance, the group of attributes which make up the connotation of a general term are decided by convention, tacit or avowed; they are those which are 'generally accepted' as distinctive and determining. But this convention, of course, lets in considerations of time and circumstance. That accession of new information would affect our decision about the connotation is always admitted, for the newly discovered attributes may force their importance and number upon the attention. But there is an even more important cause of change of convention than this, though it is often overlooked. A change in our point of view may considerably alter the order of importance of the attributes. What, for instance, is the definition of an ellipse, that is, the connotation of that term? To an ancient it was regarded as the curve obtainable by a plane section of a cone. It was one of the conic sections. But this is not the modern meaning; so far from it, that the fact of the ellipse being so obtainable only comes out, later in our study, as a remote corollary by mathematical deduction. It would now probably be defined as 'a plane closed curve of the second order'; for our whole way of regarding geometry has been affected by the introduction of Cartesian co-ordinates. What may be the next similar change in our point of view and consequent definition must be left to advanced geometricians to determine. The same change of view may be detected in the classifications of biology. What we may term the 'chasm of separation' theory of Natural Kinds, so familiar to readers of Mill, is being very generally abandoned. We do not now seek for that indefinite number of attributes which are to distinguish class from class; we do not even try to arrange and group our natural classes in accordance with their possession of the greatest number of important attributes. At least their importance is not one which would strike any ordinary eye.* What the classifier mostly aims at now, and what he is considered to have been unconsciously aiming at for some previous time, is to arrange the classes in accordance with their actual affinity by relationship and origin, genealogically that is. This point of view, depending on the theory of Evolution, *may* be the final one, but no one would yet venture to assert this positively. We are therefore to some extent in a difficulty when asked to say what is the essence, meaning, or connotation of any general term. We cannot say that it comprises *all* the attributes possessed in common by the objects in the corresponding class, for these may be infinitely numerous; moreover we should thus be losing the very useful distinction between real and verbal propositions. Nor, again, can we seek it in the

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*See this very clearly brought out in Mr. A. R. Wallace's *Tropical Nature*, where he shows that in many cases some of the *least* obvious and striking, and, in any common sense of the word, important, attributes are the most valuable for the purposes of the scientific classifier.

attributes 'universally understood' by the term, for there is no such general consensus. We can really only seek it in the attributes generally assigned by those who are competently informed upon the subject. Within these limits of time and place there doubtless is some extent of agreement. This may not sound a very philosophic explanation, but it is best to avow it as the most tenable which is open to us.

Another expression which raises somewhat similar difficulties is that of 'Compatibility'. As Mr. Read says: "Relations of classes that *may* coincide are compatible". "Relations that *cannot* coincide are incompatible." I have no wish to quarrel with these terms, or abolish them from Logic: in fact we could not well get on without them. But they cannot be properly explained without taking into account not merely the objective attributes of the phenomena but also our own recognition and appreciation of these attributes. Looked at objectively, relations that 'cannot coincide' are simply those that never *do* coincide. There is no further meaning in the impossibility, and it is therefore adequately expressed by an ordinary universal negative. But what are, in themselves, relations that '*may* coincide'? As Bishop Butler says, things are what they are; any two relations either do or do not, wholly or partially, coincide, and could therefore be expressible by one or other of the A, E, I, O propositions. Any use therefore of the word 'may' is an introduction into the question of human ignorance about these relations, and a departure so far from strict objectivity.

Mr. Read has not indeed overlooked these considerations. He says (p. 157):—"We must distinguish three conditions of a phenomenon: (1) As it really is; (2) As we know it; (3) As our knowledge of it is expressed". The first of these means of course as the thing is phenomenally, not as it is *per se;* it means, that is, the knowledge which creatures with our faculties might eventually hope to attain to about it. But the second needs, I think, some explanation; 'as we know it' may mean anything or nothing, according to the persons referred to. The distinction here, as just remarked, is not the absolute one between the phenomenal and the noümenal, but the very relative one between the better and the worse known phenomenal. We ought therefore, I think, to have it clearly pointed out that the purely objective view has been here set aside, and that some convention has to be admitted as to the quantity of knowledge which may be postulated in reference to the phenomena, just as was found to be the case in reference to the definition of any term.

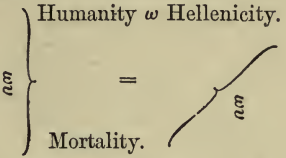
Mr. Read's discussions upon the subject of Causation seem to me very sound and useful, and to mark all that advance upon the older views which one would expect in a thoughtful student of the principles of modern physical science. Mill's view, as we understand him to say, is essentially the popular view; though refined, generalised, and rendered as rigidly and scientifically accurate as it admits of being. But it implies something *discontinuous;* the cause and the effect are events, that is, are fragments of experience broken off and regarded as something separate and distinct each from the other. We have not sufficiently prominently set before us that absolute continuity of development which now finds expression in the doctrine of the Conservation of Energy. For ordinary purposes the ordinary view is necessary. It is only in terms so expressed that we can put and answer the question, What is the cause of such and such an occurrence? *i.e.*, How can it be brought about or avoided? And the well-known 'Four Methods' represent this view, carefully guarded, and advanced to the furthest point to which it is capable of being pushed. But when we proceed to subject it to close scientific scrutiny, we find that it is far from being capable of bearing the whole weight which it is attempted to put upon it. To mention no other instances, we should say that such puzzles as whether the effect can continue to persist after the cause has ceased, and whether an interval (however small) must exist between the cause and effect, have no other origin than this. They arise out of the attempt to combine a definition of cause, grounded on popular usage and limited by popular needs, with the rigid analysis and minute accuracy claimed by abstract scientific principles.

On the same grounds Mr. Read sees his way to getting rid of a distinction which must have before now seemed groundless to close thinkers, that, namely, of Plurality of Causes, or, as he terms it, Vicariousness of Causes. From the practical point of view the recognition of this vicariousness is abundantly useful, and indeed necessary. A man is found dead: what is the cause of his death? Was it accident, violence, suicide, or what? In this sense of the term many causes are possible. But, as soon as any one who is imbued with the conception of an orderly continuous evolution of phenomena comes to scrutinise these terms, he fails to see in 'cause' more than what goes before, and in 'effect' more than what comes after; and mere sequence in time can produce no such essential distinction as to admit of Plurality of Causes and exclude Plurality of Effects. Insist on taking account of every antecedent and of every consequent, and either term of the pair will necessarily imply the other. No one cause could venture to take the place of any other cause in hopes of producing the same effect; but every difference of antecedent must imply a difference of consequent, and *vice versâ.*

The part of Mr. Read's essay which is most original is that in which he discusses the nature of syllogistic reasoning, but the treatment seems to me too brief to do full justice to his views. Working mainly on the lines of Mr. H. Spencer, he differs from him on one important point, *viz*, the number of terms employed in the syllogism. The following extract (p. 240) contains, I think, the gist of his reasoning :—

> "To take an example: how many terms has this syllogism?
>
> Men are mortal:
> Greeks are men:
> Greeks are mortal.
>
> According to the old view, there are three terms: Greeks, Men, Mortals; or in comprehension, Mortality, Humanity, Hellenicity: and either way the three terms slide one into the other, as one shuts up a telescope.

According to Mill's Axiom, the correlation might be symbolised thus [in Mr. Read's symbols *]—



This, however, does not represent a relationship of classes at all; but only the concomitance of certain three qualities in the members of one class, namely, Greeks. For Hellenicity is not concomitant with all Humanity, nor Humanity with all Mortality. The evidence thus adduced for the mortality of Greeks is, the mortality of Greeks and no more: but much more is intended when it is argued that Greeks are mortal, because all men are. To rely on Mill's Axiom is to lose all that evidence of the mortality of Greeks which is derived from the mortality of the rest of mankind.

So far then I agree with Mr. Spencer that Mill's view is insufficient: . . . ."

As I have said, the treatment here seems far too brief to do itself justice; at least, after perusing the passage a great many times, I have failed to understand it. In the first place, the words, "this, however, does not represent a relationship of classes at all," would seem to imply that Mill regarded syllogism, in accordance with the old view, as being primarily a matter of reference of classes to one another. But this can scarcely be meant, for Mill's view that propositions are nearly always to be interpreted (especially as regards their predicates) in connotation rather than in denotation, and his consequent rejection of Aristotle's *Dictum*, are too well-known for this to be possible. Then, again, with regard to the statement that "the evidence thus adduced for the mortality of Greeks is, the mortality of Greeks and nothing more". Let us take a still narrower case, that, namely, of an individual instead of a class. When we thus infer the mortality of Socrates instead of that of Greeks generally, is it meant that "the evidence thus adduced for the mortality of Socrates is, the mortality of Socrates and nothing more,"—Socrates, say, being still alive? If so, Mr. Read would, we may apprehend, naturally have chosen such an example, for it would have raised a far stronger objection, amounting in fact to a reduction to absurdity. But what else it can mean I do not see.

Mr. Read's main reason is presumably given in his remark that "the differential nature of Greeks is here omitted; wherein perhaps there may lurk something incompatible with mortality". True, there *may*; this is a contingency which can never be entirely obviated when, as here, we are supposed to be applying the syllogism to a new and unobserved case, or at least to be giving such an exposition of it as will suffice to cover new cases. No induction can be absolutely certain. Mr. Read seems to be omitting from consideration the fact that in the wide group denoted by 'men' we have already taken account of a multitude of precisely similar 'differential natures' among other nations,—Romans, various kinds of barbarians, and so on. If there were any reason to suppose that Hellenicity is specially antagonistic to mortality, it would show that our induction was being extended to a hazardous case, no doubt; but this does not appear to be a fair general ground of objection to the theory. And there seems another flaw in this objection. When Mr. Read speaks thus of Hellenicity,—the differential nature of Greeks,—is he not presupposing more knowledge than we have a right to expect? What, in fact, is Hellenicity? and what is the convention about the number of attributes to be included in this term? When we speak of Humanity and Mortality, all is clear enough; the previous inductions which decided that man is mortal may be supposed to have settled and defined these terms accurately already. But then a new man, a Greek, comes before us: can we fairly assume that we are already so familiar with him and his fellow-countrymen as to know distinctly what is meant by Hellenicity? The old class-theory of the syllogism would not demand this: Greeks, in respect of their denotation, might be known possibly by some casual attribute easy of observation; but when we speak of Hellenicity we surely mean to refer to the essential attributes of the term, and this, as already remarked, is a matter demanding a very definite convention and agreement.

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* ω is the sign of co-existence, *v* of succession.

It will be best to take a new example, both to get rid of the inveterate associations connected with man and his mortality, and to see how the newly observed case looks when it is presented to us without being already ticketed with a familiar name. Suppose, then, that we have arrived at the conclusion that all cruciferous plants are wholesome, or at least harmless. A shipwrecked crew on some desert island light upon a species of the cruciferæ, and infer that they may proceed to eat it. Now what corresponds to 'Hellenicity' here is the group of determining characteristics of this new species. But what do these sailors know of these characteristics? It would be an ill thing for them if they had to wait for such information before feeling sure of their inference. All that they observe is Crucifericity, if one may so call it (with which we suppose them already familiar), *plus* a multitude of other attributes, some of them accidental to the individual, others common to, and characteristic of, its species. But they have no means of distinguishing between the accidental and the essential, and therefore no power of taking account of any such bundle of attributes as would correspond to the Hellenicity of the last example.

Mill's explanation of such an example is, I think, plain, and we can easily see where he gets his three terms of the syllogism. We have observed that the attributes of the cruciferæ are accompanied by wholesomeness:—there we have two terms. The new plant or plants yield the third term; the exact extension of which is perfectly immaterial. All that we care to observe is the presence of the cruciferous attributes: the additional presence of other attributes as well, which serve to make a third term of it, does not really concern us. Equally easy is it to see where Mr. Spencer finds his *four* terms. The first two are the same as above. The third term becomes a third, not merely on account of the non-cruciferous additional attributes, but also because (as he maintains) these cruciferous attributes themselves are not the *same* as those which yield the induction expressed in the conjunction of the first two terms, but merely *like* them. The fourth term is the 'wholesomeness' of the new plants; which, like their cruciferous attributes, merely *resembles* the former observed wholesomeness.

But how does Mr. Read get his *five* terms of the syllogism? Four I can see clearly enough; but the fifth, which is yielded by distinguishing, in the former familiar example, between Hellenicity and Hellenic Humanity, seems to me to rest upon an illusion caused by our long familiarity with two distinct names. When we come to deal with a new example we have not even the names whereby to express the corresponding distinction, and it is difficult to see how more than four terms can be conceived as necessary.

Mr. Read's formal statement of his principle, or 'Rule of Quinque-terminal Correlation,' as he designates it, is as follows:—"A Term which coexists with a second Term—that second Term and a third being severally the same as a fourth and a fifth Term, which are related to one another by Co-existence or Succession,—is related to the third Term, as the fourth to the fifth, and as the second to the third". It is not easy to apply this rule to the example I have proposed, from want of the requisite names, so we must revert to the old example. The five terms here are respectively, Hellenicity, Hellenic Humanity, Mortality of Hellenic Humanity, Non-Hellenic Humanity, Mortality of Non-Hellenic Humanity. Of these, the fourth and fifth correspond to the first pair, or relation, of Mr. Spencer; the first and second (taken together), and the third, correspond to his second pair;—these two pairs, or relations, on Mr. Spencer's scheme, being recognised as 'like' one another. It is just this subdivision by Mr. Read of the first member of the second pair into two, Hellenicity and Hellenic Humanity, which seems to me unnecessary, and in most cases unattainable, at least with any accuracy. When we observe our new case, I do not see why we need do more than recognise in it the same (or the like) attributes as we had already perceived in former cases. Its additional or specific attributes do not concern us; if we are drawing the conclusion about an individual we do not want them, and if about the whole of a new species, the determining characteristics of that species may be unknown as yet.

One other novelty in Mr. Read's system is his symbolic expression of the various kinds of relation (such as similarity, coexistence, &c.) which are required to be expressed in that extended view of the reasoning process taken by Mr. Spencer. These have been introduced into the extract quoted above, and were set out by Mr. Read himself in MIND VII. It is hard for those whose business requires them to keep in mind a number of distinct sets of symbols, Hamilton's, Boole's, De Morgan's, Jevons's, and so on, to regard entirely without prejudice the introduction of a new set. But laying this prejudice aside, Mr. Read's seem to me decidedly suitable and good.

J. VENN.

Les trois premières années de l'Enfant.] Par BERNARD PEREZ. Paris : Germer Baillière et Cie, 1878. Pp. xiv. and 294.

M. Bernard Perez belongs to the unofficial but already important school of French thinkers who welcome and appreciate to the full Mr. Darwin's work. They are paying it the best kind of tribute by carrying out its principles in researches of their own, and M. Perez has here given us an excellent study of human development on what one may call Darwinian lines. It is a series of careful and well-considered observations on the natural history of the children of civilised European parents during the first three years of life. We may assume that all the subjects observed were the children of persons of a certain standing and culture ; but whatever hereditary differences may be due to ancestral education and refinement probably do not come out until a much later time, or at all events may be neglected in the present rough state of our knowledge.

A study of this kind may be arranged chronologically or analytically; it may follow the history of the child from birth onwards, which seems the natural way when only one individual is dealt with, or it may be distributed according to the several functions and activities whose development is observed. M. Perez, having it would seem a rather extensive acquaintance with small children, has adopted the latter method, which enables many distinct observations to be conveniently grouped. This entails indeed a certain amount of repetition, from which M. Perez has very wisely not shrunk on the necessary occasions. At the same time he proceeds from the simpler to the more complex functions, thus following the order of growth as far as his method allows.

He begins with the first evidences of sensibility to the influence of the outer world—the earliest pleasures and pains of taste, touch, heat and cold, sight, hearing, and smelling. He goes on to the appearance of the passions in a rudimentary form. Fear, jealousy, anger, are all noted at two months old and even less. St. Augustine was much shocked by the sight of two children fighting for the breast at a very early age, and found in it a proof of original sin. The observation is perhaps the earliest on record, except the case of Jacob and Esau, but does not deserve much credit from a scientific point of view. M. Perez does not notice it, possibly for that reason. Curiosity, the association of pleasant or painful sentiments with particular objects, and the dawn of the social feelings, are then passed in review. As to animals, M. Perez thinks they are to a child's mind mere playthings, more amusing because they afford more variety. Probably this is so for some time : but at a later stage the dog or cat is treated very much like a person. I have seen a child of two years old gravely attempt to make the cat look at pictures, offer its doll to be kissed, and the like. But (in confirmation of M. Perez) a few months earlier one of the same child's ambitions in life was to stand on the cat's tail, and she obviously could not see why it should object. As to human sympathies, children are unfeeling, "par défaut d'expérience et faiblesse de jugement" : they can be much affected by real or supposed pains of which they have some experience in their own persons. A child that has just cried at being dipped in the sea will cry again when the nurse dips herself for her own pleasure; and M. Perez gives a similar instance from a friend's notes.

The next topic is "motricité," the development of motions both reflex and voluntary. Here Mr. Darwin's materials are freely used, and M. Perez adds some notes of his own on the early biography of two kittens. He compares their progress with the much later and more conscious advances of an infant learning to walk. As to voluntary activity in general, M. Perez' position is that "la volonté est toujours déterminée par un sentiment, qu'il soit ou non clairement aperçu par la conscience". The practical conclusion, justly insisted on as of great importance, is that the will must be educated through the emotions, and education of the emotions can hardly begin too soon. The growth of self-consciousness, attention (which English nurses call "taking notice"), and memory are then traced; and chapters which are both instructive and amusing are given to association, the formation of general ideas, and comparison. M. Perez treats comparison as an outgrowth of abstraction; I should myself be disposed to think that abstraction involves the perception of resemblance, the perception of difference being an ultimate element in consciousness itself. But this belongs to general psychology, if not to metaphysics. And besides M. Perez is dealing with the comparison of feelings already grouped into concepts. A droll example is given from the bewilderment of a child of eight months, who was unable for several minutes to make out that two grey cats of about the same size were not one and the same. The first effect on its mind must have been something like Kehama diving into the realm of Yama by eight gates at once.

Under the head of imagination we have a rather miscellaneous list of notes, including the beginnings of dramatic play. M. Perez notices a curious point, which must be familiar to even casual observers, and which many of us may remember in our own persons; I mean the fixed obstinacy of children in requiring to have a song or story in the exact form in which they first heard it. It is a letter-worship of the most rigorous kind, and the habit endures almost into years of discretion; in some cases probably longer. My own recollection informs me distinctly enough of a little boy who, long after he could read, assumed everything he saw in print to be absolute truth. Is not this rather a poverty of imagination than a positive manifestation of it? There is the power of conceiving the story or statement and making it a mental possession, of retaining what is put in. But there is also the incapacity for entertaining anything different; whatever is first put in occupies as it were the whole field, and maintains a possessory title, however acquired, against all new comers.

On the point of generalisation, M. Perez differs from the opinion of Max Müller and Taine, that no general ideas can be formed without words; he accepts M. Taine's instances, but interprets them otherwise, holding that "le mot progresse comme l'idée et par l'idée". In the chapter on judgment we have further excerpts from the biography of the two kittens already mentioned, and some very curious facts from M. Houzeau on the powers of certain animals to count. There is distinct evidence that mules can count up to five. Mankind are long in learning this art. It is said that European children cannot count ten with intelligence under the age of 6 or 7 years. A little friend of M. Perez, two years and a half old, had no notion of what was meant by three days. It had to be paraphrased to him as "demain, demain, et encore demain".

We pass on to the more complex feats of reasoning and language. M. Perez has some excellent remarks on the folly of repressing the mental growth of children by too much supervision; he counsels a "vigilant and benevolent neutrality, not occasional despotic interference". On the formation of language, M. Taine's notes, which have already been before the readers of the MIND, are in part reproduced. Attention is called to the monosyllabic character of infantile language, which I have myself found very conspicuous. Occasion is found for another valuable practical remark, that early facility in talking is by no means a safe measure of real intellectual progress. "Plus un enfant est intelligent, moins il se paie de mots, plus il faut que les mots signifient quelque chose pour qu'il les apprenne, et c'est pourquoi il n'en apprend qu'à mesure qu'il se fait des idées nettes des objets." One of the greatest dangers in early education is the filling of children's ears and mouth with words they do not (or even cannot by any possibility) understand. The relatively very late place of "l'idée du moi"—*I-making*, as the Indian philosophers called it—in the growth of the individual mind is carefully brought out. M. Perez thinks that even when "I" does come to be used, it is at first only as a proper name; a synonym for the "Paul" or "Mary" with which the child formerly spoke of itself in the third person. And indeed it is pretty obvious that, being unique as a generic name both in meaning and in usage, the term "I" cannot be grasped in its full import without a considerable intellectual effort. The general sense of personality, the feeling of an individual existence to be maintained and the self-regarding desires which flow from it, are of course much earlier. Has any language yet been found in which the personal pronouns are defective, or show any clear traces of their date of formation? The point seems worth attention.

The last chapter deals with the rudiments of the moral sense, and lands us on the threshold of adult psychology. Some anecdotes are given which show the uses of a cat—especially a cat "qui n'est pas endurante"—in the moral education of a masterful child. In the case of an only child the cat is indeed the only power that can make itself respected on a footing of independent and equal rights. Probably a dog would not do so well; dogs are too long-suffering.

M. Perez' book is very pleasant reading, and neither its interest nor its uses ought to be confined to students of psychology. I hope that it may find its way to the hands of many parents both in France and elsewhere.

F. POLLOCK.

SEBASTIANO TURBIGLIO: *Le Antitese tra il Medioeva e l'Età Moderna nella Storia della Filosofia in ispecie nella dottrina morale di Malebranche.* Roma, 1877.

The author of this work is professor of the history of philosophy in the University of Rome. He has devoted himself with great zeal to the study of the history of modern philosophy, and during the last twelve years has published several works which, although small in size, are weighty with the results of intense and subtle research. His *History of the doctrine of Descartes and of its logical development in the chief representatives of the Cartesian School*, his *Experimental Philosophy of John Locke reconstructed à priori*, and *Spinoza and the transformations of his thought*, will be acknowledged to be remarkably able treatises even by critics who find their value lessened by the presence and operation of certain principles which the author has, unfortunately perhaps, adopted as essential to true historical criticism.

The work now to be noticed is dedicated to Prof. Zeller of Berlin, whom Signor Turbiglio regards as an illustrious example of the highest type of the historian of philosophy, and whose banner he professes to have chosen as his own, while indicating that he differs from him on some secondary points. An attentive examination of the work itself will probably convince most persons that he has underestimated the differences between his views and those of Prof. Zeller as to the method and principles of the history of philosophy; these differences being more numerous than he himself seems to suspect, while some of them are certainly not secondary but fundamental. There follows a long preface, and obviously the work has been written rather for the sake of the preface than the preface for the sake of the work. Here the author explains the principles on which he has proceeded in his former publications, and endeavours to vindicate and establish them. He hopes thus to show the futility of the criticisms directed against his treatise on Spinoza by Ulrici in the *Zeitschrift für Philosophie*, by a writer in the *Westminster Review*, by M. Espinas in the *Revue Philosophique*, and by the author of the notice in MIND V., who may as well confess himself, since the notice happened to be unsigned, to be the same person as the present reviewer. But, however it may be with the others, the writer of the notice in MIND has certainly not found in Signor Turbiglio's lucid exposition any reason to modify his judgment. He can assent to few of the so-called principles which are there presented; from most of them he decidedly dissents. For example, he cannot admit that the historian of philosophy ought to abstain, as Signor Turbiglio thinks, from inquiries regarding the truth and value of the systems which he analyses and reconstructs; that historical criticism is independent and exclusive of scientific criticism. Signor Turbiglio perceives that the history of no science could be written on this principle, but he believes that the objects of philosophy are merely general ideas formed by the synthetic power of the mind, while the sciences are conversant with particular facts and the real relations which unite them. Is this, however, not merely to urge in support of an error another, or rather, by implication, a whole series of other errors? That the objects of philosophy are general mental conceptions,—that the objects of the sciences are particular facts,—that the history of philosophy is essentially different from the history of a science,—that philosophy ought to be regarded by its historians otherwise than it has been regarded by all men who seriously philosophised, namely, as the search for ultimate truth,—and that history may have its standard in itself apart from the reality and value of that of which it is the history,—are all propositions involved, and even more or less explicitly avowed, in the argument of our author, while they seem to his reviewer to be subjective and unprovable dogmata which it is necessary to repudiate in the interests of genuine historical research. Again, Signor Turbiglio directly combats the view of Zeller that the free-will or personality of philosophers must be treated by the historian of philosophy as among the causes of the development of speculative thought. He holds that liberty must be eliminated, and that the history must be regarded as a necessary process. But his reasons for this seem unsatisfactory. Were it even true, as he supposes, that the history would be more easily and thoroughly explicable if personal forces did not require to be taken into account, it by no means follows that the convenience of the historian has actually been consulted, while the supposition is itself a most questionable one. The argument from the logical character of the development of Cartesianism in its chief representatives shows that the history of philosophy is a rational process, but not that it is an involuntary one. The historian has no right to assume either liberty or necessity as a principle. Perhaps he has no need to infer either as a consequence.

The most distinctive of Signor Turbiglio's principles is the difference between the apparent and the real in philosophical systems. It has gradually attained its present dominant influence over his mind. In his work on Cartesianism it was present only as the idea that there was an impersonal and necessary evolution of thought from representative to representative of the school. In that on Locke it appeared as the thesis that Locke willed one thing and performed another,—believed that he had built up a system by patient induction when that system was really the result of a continuous deduction. In the treatise on Spinoza it came still more clearly to light in the doctrine of a real and an apparent Spinoza. In the work before us it is formulated and defended as a fundamental principle of the highest importance. Has the course of Signor Turbiglio been in this respect a growth in truth or error? I confess that I think it to have been the latter. He seeks to establish his opinion by showing that the distinction between appearance and reality is recognised in all the sciences. But he overlooks two weighty considerations. First, he fails to observe that even in the sciences the distinction is neither essential nor definite, arising entirely from the relativity of knowledge. Truth to a dull and feeble sense is not truth to one which is acute and strong; truth to sense is not truth to intellect; every cognition when transcended and replaced by one more comprehensive and adequate is supposed to have been reduced from the rank of an expression of reality to that of an expression of appearance. It will be observed, however, that here there need not be merely two, but, may be, an infinite number of stages, and that the lowest stage of so-called appearance may be as real as that highest stage which is supposed to be reality merely because it has not yet been transcended. Again, he fails to recognise that even if the distinction for which he contends could be traced in the *objects* of astronomy, chemistry, biology, &c., it would not follow that it could be traced in consciously and carefully constructed *systems* either of science or of philosophy. Is there a real and an apparent Newton in the *Principia*, or a real and an apparent Laplace in the *Mécanique celeste?* If not, how is there a real and an apparent Locke in the *Essay concerning Human Understanding*, or a real and an apparent Spinoza in the *Ethica?* The proper comparison is obviously between philosophy and science as existing in a mind or expounded in a book, not between philosophy and the objects of science. The transition from things to thoughts involved in Signor Turbiglio's argument renders it irrelevant and inconclusive. I do not admit, then, that two philosophies can be evolved out of one. When Signor Turbiglio attempts to do this, as in the case of Spinoza, it is by a rearrangement or reconstruction of the philosopher's thoughts, which seems to me necessarily to alter their signification. No more was meant than this when I said that he had "arbitrarily, although most ingeniously, rearranged the thoughts of Spinoza, and given the words in which Spinoza expressed them a new meaning in their new connexion". No "*grave accusa*" or "*acerba censura*" was in the least implied, but merely dissent from a method or principle of retrospective reconstruction. Signor Turbiglio's critical honesty and conscientiousness are as manifest as his ability.

The rest of the treatise consists of three parts, the first treating of the genesis of modern philosophy, the second of the pantheistic idea in the modern age, and the third of the evolution of the moral idea in Malebranche. Several of the generalisations in them appear to have been derived from an inadequate survey of the relevant facts, but every chapter is so full of independent views and so richly suggestive that justice could be done to the book only by a long review, instead of a mere notice. The work is one to be cordially recommended. Its author is a man of genuine talent both as a thinker and a writer. All who are acquainted with what he has already done will rejoice to know that he has it in view to publish the results of his studies on the philosophy of the Renaissance.

R. FLINT.

Die Axiome der Geometrie. Eine philosophische Untersuchung zur Riemann-Helmholtz'schen Raumtheorie. Von Dr. BENNO ERDMANN, Privatdocenten der Philosophie an der Universität zu Berlin. Leipzig: Voss, 1877.

This is a valuable monograph, intended to reconcile the diverse opinions touching the philosophical import of the new non-Euclidean geometry. According to Dr. Erdmann, the axioms of Euclid give rise to questions concerning both their systematic connexion and their origin and meaning. Besides the axioms applicable to quantities of any sort, there are others stating properties of space. The chief difficulty was always felt about the eleventh axiom, which, involving the notion of parallels and the sum of the angles in a triangle, stood altogether apart, and could neither be dispensed with nor logically connected with any other fundamental dictum. At last, from the speculations of Lobatschewsky, Bolyai, and Gauss, it appeared that a consistent geometrical doctrine may be evolved from an hypothesis in contradiction with the said axiom; and soon after, the late Bernhard Riemann discussed space in general and showed that those contradictory systems, Euclidean and Imaginary Geometry, are the expressions of different kinds of space that we may in turn assume as existing. Continued chiefly by Beltrami and Helmholtz, these researches have finally led to a comprehensive theory that may be termed Pangeometry, and is discussed at length in Dr. Erdmann's second chapter (pp. 34-88). Although admitting that our presentation of space is an intuition *sui generis*, the author observes that we have in particular not only intuitions of lines, triangles, &c., but concepts of such as geometrical species, and that these may be treated not only as concepts of space but of quantity, so as to be determinable by algebraic formulas. Now in the same manner we may form a concept of our universal space as of a quantity: *viz.*, a continuous quantity, of which the elements are universally determined by three commensurable variables, and with a constant measure of curvature equal to zero. Generalising the number of variables into *n*, and omitting the amount of the curvature, we obtain a *summum genus* of spaces with a constant curvature, and hence, by replacing the number three, we come down to a concept that embraces our own space as well as spherical space with a positive, and pseudospherical space with a negative, measure of curvature. So Pangeometry branches out into different alternatives, of which Euclidean geometry is but one, and by the light of this discovery the traditional axioms may be reconstructed so as to determine the kind of space considered in our usual geometry, and provide the elements for its production. Restoring the intuitional character which we disregarded while treating of space merely as a sort of quantity, our common space is described as "a threefold extended complexity, congruent in itself and flat (endless)". All this would be perfectly clear, if we were only taught how to conceive a measure of curvature without recurring to intuition.

In a third chapter (pp. 89-135) the philosophical consequences of the new doctrine are discussed. Thinkers now all but universally admit that our spacial presentation cannot be the simple repetition of an arrangement of real things that affect our senses. On the other hand they will be ready to concede that it is dependent not only on a predisposition or capacity of our mind, but also on the nature of impressions that prompt the mind to form its presentations. From the fact of Pangeometry we learn that our mental predisposition in itself admits of more than one sort of spacial intuition, so that it must needs be the impressions that determine the specifically Euclidean properties of our actual image of the world. So much for empirism as against nativism in psychology. Turning to the epistemological question, Dr. Erdmann shows that our presentations may be viewed either as dependent on or independent of the things represented; and, in another respect, either as faithful likenesses of things, or as reproductions only of their form (say, of quantitative relations of space, time, and law), or else, as mere indications of their presence, that vary together with the nature of things, while differing from them in nature altogether. Accordingly, "empirism" may be subdivided into *sensualism*, *formal empirism*, and *apriorism*; and, on the same principle, "rationalism" into the *doctrine of pre-established harmony*, *formal rationalism*, and *absolute rationalism* or *nativism*. It is true that few historical systems tally exactly with these distinctions. Most of them offer a compromise between two or more of the typical doctrines, which it will be well, for clearness' sake, to resolve into its constituents. So much we see already, that the modern geometry is incompatible with any kind of "rationalism". Choosing between the possible sorts of "empirism," Riemann and Helmholtz declare for its formal variety, whereas our author offers his reasons for adopting what he terms *apriorism*, though he grants that even sensualism, "the naïve assumption of the unscientific consciousness," is not repudiated by the new mathematics.

In the fourth chapter (pp. 136-174) Dr. Erdmann draws up his conclusions in the regular form of a philosophical theory of geometry. His readers will find that there are few philosophical treatises, especially in German, so skilfully arranged and neatly worded as this little book, to the merits of which it is impossible to do full justice in a brief notice like the present.* Of course, the author will not expect to have silenced all opponents. As such we may already point out A. Weissenborn in Avenarius's *Vierteljahrschrift* (II., 2 and 3), and Albrecht Krause in a separate publication.† On his own part, the present writer may be excused for briefly stating the cardinal doubts that remain with him unshaken even after both Dr. Erdmann's monograph and Prof. Helmholtz's second paper (in MIND X.).

To borrow the terminology just explained, the characteristic feature of Kant's space-theory appears to be not "rationalism" but "apriorism".‡ In the third section of his last article, Prof. Helm-

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*It is hardly worth while to enumerate oversights. P. 51, *in fine*, the words *Nenner* and *Zähler* ought to change places; *cf.* p. 57. P. 90, l. 10, read: *der eine jener Fragen*. Of material difficulties I mention merely as an example the "rigorous definition" on p. 155: "A straight line is one of which every linear element has zero for its constant measure of curvature". Now, a measure of curvature, according to pp. 51 and 57, is conceived by means of radii, and how to conceive radii except as a kind of straight lines?

†*Kant und Helmholtz über den Ursprung und die Bedeutung der Raumanschauung und der geometrischen Axiome.* Lahr: Schauenburg, 1878.

‡See, *e.g.*, Kant's *Werke*, III., p. 154, Rosenkr: "All knowledge of

holtz himself shifts his position for a moment from "formal" to "aprioristic empirism". That sensual experience is a *conditio sine qua non* for the actual occurrence of spacial intuitions, is also a point of Kantian doctrine.* And Dr. Erdmann adopts Prof. Hemholtz's statement,† that Kant differs from the true nativists in this respect, that he only avers space-intuition to be a form of our receptivity, without assuming particular spacial intuitions as innate. Up to this point it would seem that we all four agree. Only, the new geometry (of which Kant had a presentiment as early as 1746, *Werke*, V., p. 27) appears to both our Berlin thinkers to open a prospect towards a more precise distribution of parts between mental constitution and outward influences, which I must persist in considering as wholly delusive. Supposing it could be proved, as they contend, that our mind taken by itself is equally open to the intuitions of all or several of the kinds of space defined by Pangeometry, then indeed it would follow that our actual beholding of a world in Euclidean space ought to depend on something in the impressions that codetermine our consciousness from without. But the difficulty is that the proof we require cannot really be given. First of all, in this order of investigations we have no right to appeal to physiological or psychophysical research, however admirably conducted, because this necessarily proceeds on the assumption of objective space, and the appeal is of no avail unless we could consider objective space as equivalent in some sense to absolutely real space,—which, as involving a begging of the question, we are not at liberty to do. Speaking critically, as we must do in this case, a space inhabited by an intelligent being cannot be shown to have any connexion with a space conceived in that being's mind. So the one legitimate way open to our speculators is to argue from the possibility of imagining other relations of space beside those of Euclid. Against such arguing I need not urge that this possibility is, even in the case of Prof. Helmholtz, but a very limited one. Even if fully admitting that the imaginative powers of highly cultivated men may be expanded so far as to embrace spherical, pseudospherical, and perhaps other spaces of three dimensions with the same ease as that to which we are all accustomed, we should be compelled to ask whether they owed that expansion to an emancipation from the narrowing influence of constant Euclidean experience, or rather to a more advanced development from the data of Euclidean experience itself. There is a vast difference between the notion of what our mind may be

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things merely from pure intellect or pure reason is nothing but appearance, and truth is only in experience".

* *Werke*, II., p. 340, Rosenkr: "Space—considered before any things that determine (fill or limit) it, or rather, which give an empirical intuition in accordance with its form—is (under the name of absolute space) nothing but the naked *possibility* of outward phenomena. . . . The empirical intuition is not a compound from phenomena and space (or observation and empty intuition), . . . but both are combined in one and the same empirical intuition, as its matter and form respectively."

† Erdmann, p. 105; Helmholtz, *Handb. der physiol. Optik*, p. 441.

in itself capable to perform, and what it may be trained to achieve subject to the express condition of beginning with an experience that provides an Euclidean basis and no other. Anybody studying those modern mathematical theories—of which I nowise would disparage the technical importance—will perceive their continuous generation out of the old geometry. Indeed it is from Drs. Helmholtz and Erdmann themselves that we learn to understand them in that light. With the facts before us, why should we hold Pangeometry to exist by virtue of our mental nature in spite of habits acquired by impressions from without, rather than to be a logical outgrowth of Euclidean geometry, which latter we acknowledge as the joint produce of mind and impressions? It is true that in the latter case the old question returns, unsolved as before: How much in our experience is due to the nature of mind and to solicitations from the outside respectively? But it may be better for philosophy to recognise this present state of things than impatiently to accept from physical science a sort of *solvitur ambulando.*

J. P. N. LAND.

VII.—REPORTS.

Consciousness under Chloroform.—Under this title Mr. Spencer has just added to the Appendix of Vol. I. of the *Principles of Psychology,* the following remarkable record of experience with his observations on it :—

A University graduate whose studies in Psychology and Philosophy have made him an observer able to see the meanings of his experiences, has furnished me with the following account of the feelings and ideas that arose in him during loss of consciousness and during return to consciousness. My correspondent, describing himself as extremely susceptible to female beauty, explains that "the girl" named in the course of the description was an unknown young lady in a railway carriage which brought him up to town to the dentist's. He says his system resisted the influence of chloroform to such a degree, that it took twenty minutes to produce insensibility: the result being that for a much longer time than usual he underwent partial hyperæsthesia instead of anæsthesia. After specifying some dreadful sensations which soon arose he goes on to say :—" . . . I began to be terrified to such a wonderful extent as I would never before have guessed possible. I made an involuntary effort to get out of the chair, and then—suddenly became aware that I was looking at nothing: while taken up by the confusion in my lungs, the outward things in the room had gone, and I was 'alone in the dark'. I felt a force on my arm (which did not strike me as the surgeon's 'hand,' but merely as an external restraint) keeping me down, and this was the last straw which made me give in, the last definite thing (smell, sound, sight or touch) I remembered outside my own body. Instantly I was seized and overwhelmed by the panic inside. I could feel every air-cell struggling spasmodically against an awful pressure. In their struggle they seemed to tear away from one another in all directions, and there was universal racking torture, while meantime the common foe, in the shape of this iron pressure, kept settling down with more and more irresistible might into every nook and crevice of the scene. My consciousness was now about this: I was not aware of anything but an isolated scene of torture, pervaded by a hitherto unknown sense of terror (and by what I have since learnt is called 'the unity of consciousness': this never deserted the scene, even down to the very last inaudible heart-beat). Yet I call it a 'scene,' because I recognised some different parts of my body, and felt that the pain in one part was not the same as that in another. Meanwhile, along with the increased intensity of convulsion in my lungs, an element of noise had sprung up. A chaotic roaring ran through my brain, innumerable drums began to beat far inside my ear, till the confusion presently came to a monstrous thudding, every thud of which wounded me like a club falling repeatedly on the same spot. . . .

"From this stage my lungs ceased to occupy me, and I forget how the struggle finished. There was a sense of comparative relief that, at any rate, *one* force was victorious, and the distraction over; the strange large fright that had seized me so entirely when I felt myself ensnared into dark suffocation was now gone also, and there was only left the huge thudding at my ears, and the terribly impetuous stroke of my heart. The thudding gradually got less acutely painful, and less loud; I remember a recognition of satisfaction that one more fearful disturbance was gone. But, while the thunder in my ear was thus growing duller, all of a sudden my heart sprang out with a more vivid flash of sensation than any of those previous ones. The force of an express engine was straining there, and like a burning ball it leapt from side to side, faster and faster, hitting me with such superhuman earnestness that I felt each time as if the iron had entered my soul, and it was all over with me for ever. (Not that 'I' was now any more than this burning hot heart and the walled space in which it was making its strokes: the rest of 'me' had gone unobserved out of focus.) Every stroke produced exquisite pain on the flesh against which it beat glowing, and there was a radiation, as from a molten lump of metal between enclosures. Presently the unbearable heat got less, and there was nothing remaining except a pendulous movement, slackening speed, and not painful. Of nothing beyond was I conscious but this warm body vibrating: not a single other part of me was left, and there was not a single other movement of any sort to attract my attention. A fading sense of infinite leisure at last, in a dreamy inaudible air; then all was hushed out of notice.

" . . . There was the breaking of a silence that might have been going on for ever in the utterly dark air. An undisturbed empty quiet was everywhere, except that a stupid presence lay like a heavy intrusion *somewhere*, — a blotch on the calm. This blotch became more inharmonious, more distinctly leaden; it was a heavier pressure,—it is actually intruding further,—and before almost there was time to wonder feebly how disagreeable was this interruption of untroubled quiet, it had loomed out as something unspeakably cruel and woeful. For a bit there was nothing more than this profoundly cruel presence, and my recognition * of it. It seemed unutterably monstrous in its nature, and I felt it like some superhuman injustice; but so entire had been the still rest all round before its shadow troubled me, that I had no notion of making the faintest remonstrance. . . . It got worse. . . . Just as the cruelty and injustice became so unbearable that I hardly could take it in, suddenly it came out a massive, pulsating *pain*, and I was all over one tender wound, with this dense pain probing me to my deepest depths. I felt *one* sympathetic body of atoms, and at each probe of the pain every single atom was forced by a tremendous pressure into all the rest, while everyone of them was acutely tender, and shrank from the wound—only there was nowhere to shrink. A little before, I had merely

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* If there were a noun belonging to the verb 'to be aware of' like 'recognition' to 'recognise,' it would be the one to use here.

felt the cruel element, in helpless passivity; now, a still more crushing probe came; for an instant it forced all my atoms into one solid steel-mass of intense agony—then, when things couldn't go much further, and all must be over, a sense of reaction emerged; there was a loosening, and I was urged into relief by uttering from my very depths, what seemed not so much (at first) a piteous remonstrance as a piteous 'expression' (like an imitation) of the pain: in fact, the sense of woe had got also *outside*, and I *heard* it, a very low, infinitely genuine, moan. . . . The next second there was a change: hitherto it had been pain *partout*—now there came a quick concentration, the pain all ran together (like quicksilver), and I suddenly was aware that it was (localised) *up on the right;* while simultaneously with this recognition of locality, a feeling of incipient *resistance* began to be in *other parts* (not that I felt them except just as *other* parts) of me from which the pain had receded. The pain itself was no less intense, rather more vivid, only I seemed to take it in a more *lively* manner: my uttering of a moan was no longer a mere faithful representation out into the air of what was inside me, but I had a slight sense of making an appeal for sympathy: to whom or to what I did not know, for there was no one or anything there. I was just going to utter a yet louder moan—as a fresh fearful imposition of force plunged into me—when, there in front of me, to the *left* of my pain, was that girl, with those lovely ankles, and the graceful Zingari brown stockings. . . . I felt, as distinctly as if some had told me aloud, that I would not make any cry, that it was not the thing.

"Now came an agonizing cold wrench, and two or three more successively, in such a hideously rough fashion, that the girl went, and everything was tortured out of me but the darkness and the gigantic racking swaying torture which was excruciating my right side. An iron force like a million-horsepower had hold of me, and I was being pulled upwards and out of where I was, while I myself seemed another million-horsepower which would *not* be pulled: the pain was something to be remembered. But up I came, the darkness got denser (I went so fast); it was vibrating, the dense agony vibrated faster; *I* was quivering, struggling, kicking out; everything was a convulsion of torture, my head seemed to come to the surface, a glimpse of light and air broke on the darkness, voices came through to me, and words; I recognised that a '*tooth*' was being slowly twisted out of my jaw, then I groaned imploringly, in true earthly style, as if this was *too much*, and I ought to be let alone now I was getting my 'head' out; then I swallowed in air, made an exertion with my 'chest' found my 'arms' were pressing something hard, grasped the 'chair' and pushed myself up out in bewildered light, just as the dentist threw away the second right molar from the upper jaw."

Concerning this account it may be remarked, on the one hand, that the higher consciousness seems not to have been wholly abolished; since there remained certain emotions and certain most general ideas of relation to objective agents. On the other hand it is to be doubted whether the partial consciousness which the narrator had during anæsthesia, is not, in the description, eked out in some measure by the ideas of his recovered consciousness carried back to them. Be this as it may, however, it is clear that certain components of consciousness disappeared and others became extremely vague, while a remainder continued tolerably distinct. And there is much significance in the relations among them:—1. There ceased earliest the sensations derived from the special senses; then the impression of force acting on the body from without; and, simultaneously, there ceased the consciousness of external space-relations. 2. There remained a vague, sense of relative position within the body; which, gradually fading, left at last only a sense of those space-relations implied by consciousness of the heart's pulsations. 3. And this cluster of related sensations produced by the heart's action, finally constituted the only remaining distinct portion of the Ego. 4. In the returning consciousness we note first a sense of pressure *somewhere:* there was no consciousness of space-relations within the body. 5. The consciousness of this was not a cognition proper. In an accompanying letter my correspondent says of it: —" 'Recognition' seems to imply installation in some previously-formed concept (talking in the Kantian way), and this is just what was *not* the case:" that is, consciousness was reduced to a state in which there was not that classing of states which constitutes thought. 6. The pain into which the pressure was transformed was similarly universal instead of local. 7. When the pain became localised its position in space was vague: it was "up on the right". 8. Concerning the apparition of "the girl," which, as my correspondent remarks, seems to have occurred somewhat out of the probable order, he says in a letter: —"I did not recognise her 'under any concept'—what I saw seemed to be almost unassisted intuition in the Kantian sense." 9. The localisation of the pain was at first the least possible—the consciousness was of that part *versus* all other parts unlocalised.

These experiences furnish remarkable verifications of certain doctrines set forth in the *Principles of Psychology.* This degradation of consciousness by chloroform, abolishing first the higher faculties and descending gradually to the lowest, may be considered as reversing that ascending genesis of consciousness which has taken place in the course of evolution; and the stages of descent may be taken as showing, in opposite order, the stages of ascent. It is significant, therefore, that impressions from the special senses, ceasing early, leave behind, as the last impression derived from without, the sense of outer force conceived as opposed by inner resistance; for this we saw to be the primordial element of consciousness. (§ 347.) Again, the fact that the consciousness of external space disappeared simultaneously with the consciousness of external force, answers to the conclusion drawn that space-ideas are built out of experiences of resistant positions, the relations among which are measured by sensations of muscular effort. (§§ 343, 348.) Further there is meaning in the fact that a vague sense of relative position within the body survived; since we concluded that by mutual exploration there is gained that knowledge of the relations among the parts of the body, which gives measures through which the developed knowledge of surrounding space is reached. (§§ 344, 345.) Once more we get evidence that the Ego admits of being progressively shorn of its higher components, until, finally, the sensations produced by the beating of the heart, remain alone to constitute the conscious self: showing in the first place, that the conscious self at any moment is really compounded of all the states of consciousness, presentative and representative, then existing (§ 219), and showing, in the second place, that it admits of being simplified so far as to lose most of the elements composing the consciousness of corporeal existence. Whence it is inferable that self-consciousness begins as a mere rudiment consisting of present sensations, without past or future. Lastly, we have the striking testimony that there exists a form of consciousness lower than that which the lowest kind of thought shows us. The simplest intellectual act implies the knowing something as such or such—implies the consciousness of it as like something previously experienced, or, otherwise, as belonging to a certain class of experiences. But we here get evidence of a stage so low that a received impression remains in consciousness unclassed: there is a passive reception of it, and an absence of the activity required to know it as such or such.

The Semicircular Canals and the "Sense of Space".—M. Elie de Cyon, who in 1873 published in *Pflüger's Archiv* an important research into the functions of the semicircular canals, has since then continued his investigations, and arrived at new or more developed results which he has recently set forth, first in the *Comptes Rendus* (1877), and more fully in a graduation-thesis presented to the Paris Faculty of Medicine (*Recherches experimentales sur les fonctions des canaux semi-circulaires et sur leur rôle dans la formation de la notion de l'espace*, 1878).

His earlier results were, shortly, these:—

(1) Through the semicircular canals we obtain a series of unconscious sensations bearing on the position of the head in space.

(2) Each canal has a strictly determinate relation to one of the dimensions of space.

(3) The loss of equilibrium and other disorders of movement observed upon section of the canals are due to disturbance of the normal sensations of which they are the organ.

These results were opposed to the views of earlier observers, more especially of Flourens, who led the way in 1828 by declaring the canals to have a moderating function in regard to the co-ordination of movements effected by the cerebellum, and of Goltz, who in 1868 (*Pflüger's Archiv* III.) pronounced the canals to be themselves the organs of equilibrium and of the co-ordination of movements. Cyon's other researches had led him wholly to disbelieve in the existence of any special organ of co-ordination for all the movements of the body, and he could only judge (so far agreeing with Goltz) that in point of fact the preservation of the bodily equilibrium did depend on the maintenance of the head's position, since the marked disorder wrought in the latter by section of the canals was found to affect the former so seriously. The positive feature of Cyon's view of the canals was the relation he sought (as far as he then could) to establish between the apprehension of space in three dimensions and the reception of (unconscious) impressions from the three canals in their different planes.

As to the precise conditions under which the impressions were received, he then, in his published memoir, hazarded no opinion, though Goltz had asserted as part of *his* theory that the (co-ordinating) function of the canals was called into play by the pressure of the endolymph on the ampullae as it varied with the movements of the head. But later investigators—Mach, Crum Brown, and Breuer—having meanwhile connected this supposition of Goltz's with a new theory of the canals, namely, that they are the organs of the sense of accelerated movement and rotation, it was in this special regard that Cyon was moved to resume and carry further the whole investigation.

He now finds, by a most varied series of experiments, a complete confirmation of the opinion he had originally, in 1873, been driven to entertain but refrained from expressing—that the cause of the excitation of the canals is not to be sought, with Goltz, in varying pressure of the endolymph; also, that the supposition is equally inadmissible in any of its modified forms as adopted by Mach and the others. The theory these put forward as to the function of the canals must also be rejected, on a variety of grounds. Thus it is found that vertigo continues to be produced by rotation after section of the nerve going to the canals. Again (Cyon urges), the canals are equally developed in animals, like frogs, that do not naturally rotate the head, and cannot therefore be supposed to have any special connexion with this kind of movement; while neither can a sense of acceleration be allowed, as the theory requires, to the exclusion of a sense of speed, nor, involving, as it obviously does, a number of conscious factors, can it be thought of as seated in the canals which themselves give rise to no conscious sensation.

Reverting, therefore, to his original view, Cyon finds, by a new series of experiments on pigeons (extending, as his earlier ones did not, to the superior vertical canal), that section of any two symmetrical canals excites oscillations of the head in the plane of the said canals, and this he lays down as an absolute law admitting of no exception. The movements of the body, in the like circumstances, are less easy to analyse, but have, speaking generally, the same direction as those of the head. Destruction of the whole six (membranous) canals with their ampullae, when successfully performed, leaves the pigeon, after a time of indescribable motor disturbance, in the state as of one that has to learn to move, to stand upright, &c.: gradually it acquires a certain power of standing and walking, if it has the use of its eyes, but it can never again fly. Unilateral section is attended in general only with a passing disturbance, even when it extends to all three canals; but the operation discloses—what Cyon (previously following Goltz) had not before observed—disorder of bodily equilibrium apart from any change in the head's attitude.

So much for pigeons. Experiments on rabbits, while yielding similar results with minor differences, reveal a new fact to which Cyon attaches special significance, namely, ocular movements apart from movements of the head, while varying, like the others, in direction according to the different canals excited. Cyon had always surmised that there must be a connexion between the canals and the oculo-motor centres, considering the importance of the part played in the perception of space by "the unconscious sensations arising from the ocular muscles themselves or their centre of innervation". Now that every excitation of the canals, however small, is actually found to produce contractions and innervations in the ocular muscles, he regards it as incontestable that the nerve-centres for the canals are in intimate physiological relation with the oculo-motor centre, and consequently that the excitation of the canals enters into the determination of our space-notions. This, accordingly, is his formal conclusion:—

"The semicircular canals are the peripheral organs of the sense of space; that is to say, the sensations excited through the nerve endings in the ampullae of the canals serve to form our notions of the three dimension of space—the sensations of each canal corresponding with one of the dimensions. By means of these sensations there is formed in our brain the representation of an ideal space, to which are referred all the perceptions of our other senses concerning the disposition of objects around us and the position of our body among these objects."

Cyon proceeds next to explain and justify this position in relation to the current theories of space-perception, leaving over, however, for separate treatment its more purely philosophical implications. Taking Helmholtz and Hering as representatives of the empiristic and of the nativistic theories, respectively, in their most developed form, he agrees with Helmholtz in rejecting Hering's view that every optical sensation, at any point of the retina, has bound up with it a definite spacial reference; but, while admitting that the empiristic theory accords altogether better with accepted physiological notions and with observed facts, he does not see, any more than Lotze (whom he quotes at length), how it can account for a representation of space in three dimensions from sensations of muscular innervation, with or without the association of 'local signs'. Instead, however, of therefore declaring the problem insoluble by physiological psychology and falling back upon a native mental faculty or tendency to perceive impressions under the form of space, as Lotze does, Cyon maintains that all the difficulties disappear if only it is admitted that we possess an organ "specially destined to furnish us with the sensations that serve to form the notion of a space in three dimensions," like the semicircular canals. The disposition of the nerves in the canals being in three planes perpendicular to one another—planes that in all vertebrates correspond, he says, exactly with the three co-ordinates of space—we can very well, Cyon thinks, understand how the "unconscious sensations of extension" that we get differently from each canal, "may be used by our intelligence for the construction of a notion of space"; and he would even maintain that "no other sense presents so intelligible a relation between representation and sensation as does the sense of space," upon this view of it. So extended, the empiristic theory becomes perfectly satisfactory. The sensations of muscular innervation, aided by 'local signs,' which that theory puts forward, have a real significance when space itself in three dimensions is proved to be an independent "acquisition of our intelligence due to the special sensations of a peripheral organ, just as the notions of colours, sounds, &c., are". And "this ideal space of three dimensions, the notion of which is formed by means of the sensations received from the three canals, serves of course equally well for determining the relation of objects in the external world by touch" or by whatever other senses, as some think, may be called into play for the purpose.*

In the remaining sections of his dissertation Cyon first sets himself to explain the phenomena of visual vertigo, produced by sudden stoppage of rotation round the longitudinal axis of the body; describing the state as one in which "the whole of space seems to us to turn within another imaginary space, in a direction opposite to that of the movement of our body". He rejects as insufficient the common view—which makes this vertigo dependent on movements of the eyeballs, causing us, in the absence of the normal sensations of innervation, to ascribe the movement of the retinal images to a movement of the external objects themselves; and would account for this and all other illusions of movement by disharmony between our perceptions at the time and our standing representation of ideal space obtained, as above, through the semicircular canals. The demeanour of animals whose canals have been operated on has all the appearance of being due to vertigo—a vertigo that must, he says, be ascribed to the disordered "sensations of space," whether or not accompanied by oscillations of eyes and head intensifying it. As for these muscular accompaniments, Cyon now believes he is in a position to say generally not only that they are secondary but that their diversity in different classes of animals depends on what the muscles are that are habitually employed by the animal for orientation in space. Thus while in pigeons, with excessively mobile heads, the disordered motion following upon the operation appears chiefly in the head-muscles, in rabbits it is the highly developed oculo-motor apparatus, and in frogs (with almost immobile head) it is the muscles of the body that are most affected by destruction of the canals. Altogether the results of lesions of the canals, from this point of view, may be thus summarised: (1) Visual vertigo produced by disharmony between space as seen and the ideal space; (2) False notions thence resulting as to the position of the body in space; (3) Disorder in the distribution of the force of innervation to the muscles.

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*Cyon also makes the remark, which doubtless he intends to follow out when drawing his promised philosophical conclusions, that his view explains the tridimensional character of Euclidean space; the geometrical axioms being imposed by the limits of our sense-organs.

What now may be supposed the normal excitant of the nerves in the canals, resulting in the sensations that serve thus for the construction of space? Though the hypothesis of Goltz and Mach—as to varying pressure of the endolymph upon the ampullae with movements of the head—must be rejected, Cyon thinks the nerve-endings in the ampullae and canals are sufficiently exposed otherwise to mechanical stimulation. The otoliths, found not only in the saccules but also in the ampullae and the canals themselves, are liable to vibrate with every movement, active or passive, of the head; and, besides, the numerous epithelial cells in the canals, so strangely formed and disposed in relation to the nerve-ends, may very well be a means of exciting the nerve-fibres that oscillate in the liquid. Nor need the excitations be only through motions of the head: the air-waves, both when sonorous and not, may also be efficient (in which connexion the faculty of recognising the direction of sound, so highly developed in savages and some animals, may be called to mind).

The sensations themselves that arise, continues Cyon, being unconscious, as the sensations of innervation also are, their character cannot be very particularly described. But, he urges, if it be remembered that sensations never are anything more for our intelligence than distinct signs whereby we form our representations, on the one hand it is not at all necessary for the formation of our notions of space that the sensations excited through the canals should contain in their nature "the idea of an extension"; while yet, on the other hand, the anatomical disposition of the nerves here, in three planes perpendicular to one another, gives a quite exceptional "facility of deducing the formation of the representation from the nature of the sensations".

Belonging to the eighth pair, with the nerve of hearing that goes to the cochlea, the nerve of the canals is commonly also called auditory; but there is no longer any excuse for this confusion. The destruction of the canals does not destroy hearing; and while in the lower grades of animal life, where the cochlea first disappears, the faculty of hearing seems to disappear also, the more indispensable power of orientation in space remains in connexion with the canals and saccules that persist still. There should, therefore, be distinguished from the nerve of hearing in the eighth pair (which has besides, in fact, two origins) the "nerve of space"—"serving for the orientation of the body in space in animals, as in man for the formation of the notion of space".

The foregoing summary of the main points in Cyon's important dissertation should suffice to show that psychologists can no longer afford to neglect, as they have mostly done hitherto, the series of physiological inquiries into the functions of the semicircular canals, of which his is but the latest and most thorough. If there is any meaning in the psychologist's reference to organic conditions, it is impossible, in the face of the facts noted above, not to allow that in the semicircular canals we have to do with organs of great importance for the psychophysical theory of objective perception. In saying this, however, one may well refuse to fall in straightway with Cyon's particular interpretation of the facts. Saying nothing of difficulties in the facts themselves, which Cyon skims over with a strange unconcern —as when he assumes that the symmetrical pairs of vertical canals have common planes—what is to be made of his space-sensations that are unconscious but yet discriminable? And how concede the absolute analogy he would establish between space and any other sensible experience? To say, as he does, that the unconscious character of the canal-sensations is no greater difficulty than in the case of the feelings of muscular innervation will not avail him, because those who attach real importance to these in the development of our space-perceptions hold them to be conscious states as much as any passive sensations; while, as for the other point, his own assertions may be turned against his view that space is just such another sensible experience as sound or colour. Though he sometimes speaks of space as a simple datum in consciousness on occasion of the stimulation of the canals, its organ, his common expression is the much more careful one— that the canals yield directly only those (unconscious) sensations out of which, as signs, the notion of space is formed. But here, surely, is a great difference. When colour or sound is referred to a physical organ, the meaning is that upon occasion of that organ being stimulated there does, in point of fact, arise in consciousness a feeling of a certain definite quality; and though we may speak of a "notion of colour" as becoming "formed," this is only as a generalised expression of the variety of colours immediately perceived—not as if the experience of colour itself were a mental construction out of simple and different elements of experience. So much, however, is this the case with space, upon Cyon's view, that he holds it quite unnecessary, for the due and normal formation of the "notion" out of the "sensations," that the nature of these should contain at all "*l'idèe d' étendue*". Be it so: but then the difference between our experience of space and the passive sensations stands plainly confessed. And there is another objection with which Cyon must reckon. Why, if, as he allows, it is possible to form a notion of space out of elements not containing in themselves "the idea of extension," should it be impossible, as the empirists hold, to construct the notion out of feelings of innervation, &c.? The whole point of his case against them lies in the disparateness between the elements they assign and the result they profess to attain. But his elements are disparate too. Either, therefore, the empiristic position is not so untenable as he represents it, or it is made no whit stronger by the addition of any such "space-sensations" as he assumes by way of the semicircular canals, and there is no alternative but, with Lotze, to declare the problem insoluble in terms of experience. This, an opponent might say, is what Cyon in the end practically does—after all the trouble he has taken to establish his new and all-important empirical factor.

EDITOR.

VIII.—NOTES AND DISCUSSIONS.

Logic and the Elements of Geometry.—Dr. Hirst, on retiring lately from the presidency of the Association for the Improvement of Geometrical Teaching, has taken notice of some observations made by me, in the first number of this journal, with reference to the Logical Introduction to the *Syllabus of Plane Geometry* issued by the Association in 1875. As it is very important that logical theorists on the one hand and scientific workers or teachers on the other should lose no opportunity of mutual understanding, Dr. Hirst's remarks are (with his permission) here reproduced from the Association's *Report* for this year, and some words of explanation are appended in reply. Dr. Hirst says:—

"The Editor of MIND, after drawing attention to the diversity of meaning attached by geometers on the one hand, and pure logicians on the other, to the words 'converse' and 'obverse,' concedes that these terms are so appropriate for his purpose that the geometer is fairly entitled to appropriate them in his own sense. Immediately afterwards, however, he protests against what he considers to be an error on our part, but what in reality is no error at all, but a necessary sequel of the concession he has just made. With regard to the two propositions which stand first in our Logical Introduction—the typical forms of which, if you remember, are—

(1) If *A be B, then C is D.*
(2) If *C be not D, then A is not B.*

he deems it inaccurate to say, as we do, that they are contrapositive *each of the other.* He admits that the second is contrapositive to the first, but denies that the first is contrapositive to the second, and this because the process of contraposition is, to him, obversion followed by conversion, and not conversion followed by obversion. He overlooks the fact, however, that these processes of obversion and conversion, as understood by the geometer, may be applied in either one or the other order, successively, without at all altering the final result; so that if once the propriety of terming the second of these propositions the contrapositive of the first be conceded, it can no longer be contested that the first must also be termed, by the geometer, the contrapositive of the second. Of course, it is admitted, on both hands, that these two propositions are logically equivalent, and therefore it might, at first sight, appear that the question at issue is merely one of terminology. This is, however, by no means the case. In fact, the writer himself admits that 'this is no mere question of naming,' and he justly observes that 'if it is important for learners to distinguish between a geometrical process and one purely logical, as the placing of this Logical Introduction at the head of the *Syllabus* implies that it is, there can be no controversy as to the necessity of exactly determining the character of the logical processes involved'. On this point I can only say that it was unquestionably our intention that the teacher should supply the determination here desiderated. It was not thought consistent with our purpose, however, to introduce these explanations into the *Syllabus*, and I, for my part, regret that such was the case, since our omission has led to misapprehensions of a still graver character than the one I have now alluded to. I was hardly prepared to find that, 'in default of special instructions,' even an accomplished logician finds himself unable 'to draw from the examples of contraposition signalised throughout the *Syllabus*, a consistent notion of the process,' and I was still less prepared for the authoritative declaration that 'it is impossible to frame *any* notion of the process of contraposition which shall apply, as required in the *Syllabus*, equally to affirmative and negative propositions'. Let us see if the geometer's notion of contraposition—for a notion he certainly has—is really so restricted. He first of all distinguishes carefully between the two parts or statements involved in every theorem; the truth of one of these—the predicate—is asserted to be a consequence of the truth of the other—the hypothesis. Now to each of these two statements, no matter whether it be of an affirmative or negative character, there is a distinct opposite, by which I mean a statement which directly contradicts the original. This granted, the process of contraposition may be said to consist, simply, in the formation of a new theorem whose hypothesis shall be the opposite of the predicate of the original, and whose predicate shall be the opposite of the former hypothesis. From this it will be seen that the process is not affected in the least by the affirmative or negative character of either the hypothesis or predicate. It is further obvious that the process of contraposition, thus defined, is a composite one. It consists, in fact, of the interchange of hypothesis and predicate, which is conversion, accompanied by the denial of hypothesis and predicate, which in itself constitutes obversion. And it is moreover evident, lastly, from what has been explained, that it is a matter of perfect indifference which of the two last-named, successive processes we first apply; so that if of two theorems one is the contrapositive of the other, then from our point of view, necessarily, the first is also the contrapositive of the second; in other words, the relation we characterise by the term contrapositive is a perfectly reciprocal one."

Thus far Dr. Hirst. In reply, I may perhaps be allowed to remind those who take an interest in this subject that the point of my observations was to urge the advantage and even necessity of extending the reference so laudably made in the *Syllabus* to the processes of logical transformation of propositions. The occasion was of this kind. While some steps are marked off in the *Syllabus* as purely logical and are called by their recognised names, certain other processes of an extra-logical character are called by the name of the logical processes to whose type they may be said to approach. Thus the purely logical process in passing from (1) to (2) above is called, as logicians now call it, Contraposition, but the logicians' word Conversion is employed to mark such a step as that from *If A is B, C is D* to *If C is D, A is B*, which is not good in logic. Now, as explained in my original Note and here repeated by Dr. Hirst, I did not complain of this; and indeed it was I that recommended to the Association the use of the logical word 'obverse' (for what in the previous modern books was very perversely called 'opposite') in a like transitive application. But then it clearly becomes very important that there should be no confusion between the original and derived use of the words, and I did not see how this could be avoided except by a more explicit statement of the fundamental logical processes than the *Syllabus* offered.

How real the danger is, Dr. Hirst must pardon me for thinking that his own remarks now show. When I say that Contraposition involves first Obversion and then Conversion, he, having occasion to use these latter words, as a geometer, in the extra-logical sense, supposes that I must mean them thus here, and blames me for not seeing that the geometer may apply the processes indifferently in any order. But if Contraposition is, as all allow, itself a purely logical transformation, there can be no question of resolving it into anything but *logical* Obversion and Conversion; nor can the fact that the geometer may equally well begin with either of *his* steps first, in any way affect my logical statement. I deny, of course, that the logical process of Contraposition consists of the two extra-logical processes in any order. If (1) is 'obverted' into *If A is not B, C is not D*, no doubt this being logically converted becomes (2); but, as is very properly remarked in the *Syllabus*, the first step is not warranted in logic, and it surely cannot be assumed in order to arrive at the legitimate contrapositive. If, on the other hand, we begin by 'converting' (1) into *If C is D, A is B*, here no doubt, with the help of the original proposition, we are entitled to pass to the so-called 'obverse' *If C is not D, A is not B*, but the extra-logical 'conversion' was illogical. Either way, then, it is no true account of Contraposition to say that it consists of Obversion and Conversion in the extra-logical sense given to them by the geometer. Contraposition can be understood as involving Obversion and Conversion only in the strict logical sense; and in this sense the question of order is not indifferent. You can get (2) from (1) logically only by Obversion followed by Conversion; you can get (1) from (2) logically only by Conversion followed by Obversion. If in either case the order of procedure is reversed, the result would be quite different. Now, if there happen to be reasons for calling by the name of Contraposition that order of procedure in which Obversion is taken first, the name cannot without confusion be applied to the reverse order which yields a quite different result; and this is what I maintained when I denied that the passage back from (2) to (1) is properly to be described as Contraposition, and declared it impossible to frame any notion of the process that shall apply equally to affirmative and negative propositions. Dr. Hirst, indeed, gives us, in other language, a view of Contraposition that seems to apply generally; but, however it may meet the practical requirements of the geometer, it only discloses anew the logical difficulty. When he divides a theorem into the two parts which geometers (again making perverse use of logical language) call hypothesis and predicate, and tells us to substitute the 'opposite' of each for the other in Contraposition, how is it known that this is an admissible substitution? The geometer will not be able to reply without entering into precisely those elementary logical considerations which it was my plea to have explicitly set out at the beginning of a geometrical course.

The particular point at issue—whether the passage from (2) to (1) above may equally well with the passage from (1) to (2) be described as Contraposition—is settled for the logician (to whom the question belongs) by a reference to the origin of the process so named. Contraposition arose out of Conversion. While the typical propositions *A*, *E*, *I* might all be converted in one way or another, the particular negative *O* —*Some S is not P*—proved inconvertible. Was there then no way of making the subject *S* stand as predicate? Yes: by obverting the proposition into what used to be called its 'equipollent' *Some S is not-P*, this could be converted (as *I*) into *Some not-P is S*; and the process was called Conversion by Negation or Contraposition, also in course of time simply Contraposition. No sooner, however, was it recognised, than the question must arise whether it was applicable to *O* only. It could not, indeed, be applied to *I*, because *I* being obverted into *O* could not then be converted; but it could be applied to *A* and *E*. Only, whereas in Conversion *A* suffered (being degraded from *All S is P* into *Some P is S*) but *E* retained its universality

(No S is P becoming *No P is S),*—in Contraposition, on the other hand, while *A* retained its universality *(All S is P* becoming *No not-P is S), E* suffered (being degraded from *No S is P* into *Some not-P is S).* Now, upon this showing, it is quite clear, as I argued originally, that theorem (2) above, corresponding as it does with the categorical *E*, cannot by this way of Contraposition be brought to (1). It can be brought to (1) only by being first converted and then obverted—a perfectly valid logical transformation, but not Contraposition. When contraposed, (2) becomes the very different proposition *In some case when A is not B, C is not D.* In short, (1) and (2) cannot be called mutually contrapositive except by a new definition of Contraposition, which shall make it cover Obverted Conversion as well as Converted Obversion. Is such a definition possible? Of course, it is possible—at the expense of logical usage: when I declared it impossible, it was on the supposition that logical usage should be maintained. Is it advisable as well as possible—advisable, that is to say, for the practical purposes of the geometer? I care not even if this should be asserted, because I am sure that the definition cannot be satisfactorily given except as based upon such an explicit reference to the fundamental processes as would satisfy any logician—when the whole business, indeed, becomes "a mere question of naming".

I end with one more remark, already thrown out in MIND III., p. 425, but which, in view of these misunderstandings, I would now accentuate. It is that geometers should abandon the use of the logical terms *converse* and *obverse* for extra-logical relations. The terms *inverse* and *reciprocal*, used by M. Delbœuf in his *Prolégomènes philosophiques de la Geométrie* (Liége, 1860), p. 88, are equally significant, while they lead to no confusion with the purely logical processes that should be familiar to every scientific reasoner—Obversion and Conversion as well as Contraposition. EDITOR.

Hegelianism and Psychology.—Some books that have lately appeared in Germany—Prof. C. Hermann's *Der Gegensatz des Classischen u. Romantischen in der neuern Philosophie* (1877), *Hegel u. die logische Frage in der Gegenwart* (1878), and Dr. G. Biedermann's *Philosophie als Begriffswissenschaft*, Th. I. (1878)—are remarkable as indicating a revival of interest in a view of philosophy which has been, so far as the public is concerned, extinct there for at least a quarter of a century. Prof. Hermann and Dr. Biedermann both accept the fundamental positions of Hegelianism, while they differ from Hegel, and from each other, in their views of the dialectical method which springs from these positions. How far they are right or wrong in their criticisms on this head, we will not here inquire; but there is some interest in the view taken by both of the significance of the system in its relation to Kant and to empirical psychology.

Hume's method was substantially the one which is common to all empirical science. Mind and externality, which, taken *per se*, are mere abstractions, are for him (to use Berkeleian language) phases of that *percipi* which is their *esse*, and his method of investigating knowledge is to treat it as itself an object of knowledge, as something given, and, in a sense, external to the mind which is observing it. To this procedure Kant took exception, on the ground that it was incapable, from its very nature, of returning an answer to the question, How is knowledge itself constituted? It is probably true that Kant was justified in his objection, in so far as he meant that Hume's method, in making the act of knowing itself an object of knowledge, could never comprehend it as the active synthesis, in which, according to the former, all existence finds its ultimate meaning and constitution. When we make the act of knowing itself an object of knowledge, we do not observe it in the aspect in which it is the *esse* of existence, but we at once come under the necessary condition of all experience, the separation of the known object from the knowing subject as distinct from and independent of it. And if Hume ever intended to transcend this separation he certainly failed. Kant, accordingly, seeing that ordinary psychology could never throw any light upon the relation of subject and object, and finding, as he thought, a certain universality and necessity in mathematical and causal judgments, which was inexplicable from mere experience, laid hold of these as points from which the metempirical conditions and elements of knowledge could be inferred, and through this method arrived at the conclusion that knowledge or experience (Berkeley's *pericipi* in its widest sense) was constituted by the logical determination of the vague manifold of sensations in certain definite and primary syntheses of pure thought, in time and space, the two *à priori* forms of sensibility. There can be no doubt that, although Kant professed to arrive at this conclusion strictly by means of his critical method, he really did so by the help of the old psychological procedure, and the confusion arising from this fact was intensified by the vague meaning of the two words 'universality' and 'necessity'. Kant might just as well, so far as metaphysical results were concerned, have started from any other point in experience (*e.g.*, the conception of quality), but he was led specially to the consideration of mathematical and causal relations by Hume, and his critical method consequently retained (as indeed from its nature it was bound to do) a decidedly psychological character and tendency.

Hegel, having had this brought under his notice by the immediate successors of Kant, and particularly by Schultze, Maimon, and Fichte, seems to have set his mind towards getting entirely rid of the psychological character of Kant's system, and accordingly he denied *in toto* the possibility of ascertaining the metempirical constitution of knowledge by inferring the conditions of its possibility from the facts of experience. Seeing that the *quasi*-separation made by Kant between the faculties was only possible so long as they were conceived as, in some sense, objects of experience (*i.e.*, known in time), Hegel adopted the only method left open to him, in treating the categories, the forms of sensibility (time and space) and, in fine, the whole of the constituent factors of knowledge, as logically reducible to intelligible relations, contained in and forming a dialectical chain, each link of which presupposed, and, at the same time, was presupposed by, every other,—a doctrine suggested to him, no doubt, by the Aristotelian theory of the active reason. Starting with the most empty category, that of being, he shows that it is meaningless except as, by dialectical implication, involving and involved by every higher category; and this, it may be remarked, is really the only sense in which Hegel can be said to have propounded a doctrine of evolution.

Kant had thought it necessary to reserve a vague manifold of sensation, which the intelligible syntheses of pure thought might qualify and so give meaning to, but Hegel, considering that this reservation arose from the fact that Kant had never got away from the psychological standpoint, declared that that vague manifold had no meaning or existence except as constituted by intelligible relations, and that the reason of the impossibility of clearly tracing out the categories in nature was that the position of the categories of nature, in the dialectical development of the notion, was that of the contingent or dialectical correlative of the abstract relations of logic, the categories of spirit dialectically combining the two, just as becoming combines being and not-being. Space and time, the ground-relations of nature, imply an externality which makes it impossible to do more than trace in a shadowy form their dialectical relation among the categories of nature.

Hegel's philosophy is thus a theory of perception in which there is no other element but mind, and in which that word means, not, as with Kant, individual intelligence, but absolute intelligence, which realises itself in and constitutes the individual. Things-in-themselves are of course meaningless abstractions for a system in which knowledge is the ultimate reality, embracing existence within itself. The individual is a moment in its dialectical development, and is characterised by the distinction between subject and object, the mark of its finiteness. But, at the same time, in individual knowledge the absolute mind reaches self-consciousness.

These are the principles which Prof. Hermann and Dr. Biedermann in the main accept, although they differ from them in the schemes of their dialectical methods. Strange as they appear, they are really, when carefully assimilated, intelligible and complete as a system of metaphysics, but what they fail to afford is a solution of those great problems of empirical psychology out of which all philosophy really takes its rise. Kant met Hume upon psychological ground in the case of questions arising within the sphere of experience, and his philosophy is therefore of great psychological interest. But Hegel, in abolishing the psychological side of Kant's system, abolished, as it appears to us, every point of contact with that English empiricism against which the latter had directed his attacks, and out of which his theory of knowledge may be said to have arisen. Empirical psychology, involving, as it does, a distinction between subject and object, is for Hegel no doubt a branch of knowledge, falling within that sphere of the timed and spaced, that contingency, which has a place as a logical moment in the Hegelian dialectic, but it is really nothing more. It has no special interest as throwing light on the problem of the constitution of experience, towards which it stands in just the same position as any other branch of empirical science, and is really no more akin to philosophy proper than is, for example, physiology. The individual has, for Hegelianism, two sides; one, in which it transcends and exists apart from time, and is of interest as a logical moment in the system of the absolute; the other, in which it is known as existent in time, and in which it belongs more or less to the sphere of nature and contingency. It is in this latter aspect alone that it is an object of experience, and it, *ipso facto*, is, as such, dialectically unintelligible. It may be quite true that in the constitution of the most indefinite sensation there are involved intelligible relations, but these relations, on Hegelian principles, can never be exhausted or systematised, nor can empirical psychology either deny their existence or take account of them. It may be true that thought constitutes its object by processes which do not lie within the sphere of time, but for empirical observation, which can take account only of temporal co-existences and sequences, this fact has no significance. The two views of mind belong to different spheres, and the *onus probandi* of showing that they come into any conflict, or even contact, lies upon those who say that it is a fault in empirical psychology that it looks at no method but its own. It is enough to say that its justification as against the post-Kantian German philosophy appears to rest upon precisely the same grounds as the justification of every other branch of empirical science.

R. B. HALDANE.

The Rule of Three in Metaphysics.—I expected to see in a later number of MIND some reference to the argument set forth in the concluding section of Prof. Clifford's article "On the Nature of Things-in-themselves," contained in No. IX.; but such expectation not being realised, I venture to take the matter up myself.

I cordially agree with the whole of the article in question except the section above-mentioned; but in that section there seems to me to be a glaring *non-sequitur*. Towards the close of the preceding section Prof. Clifford enunciates the proposition "that every *motion* of matter is simultaneous with some ejective fact or event which might be part of a consciousness". Note the word "motion" not only here, but also in Prof. Clifford's corollary, No. 2, in the same section.

The proposition which prefaces the last section is the most important one in the whole article, being the one the author aims to prove.

The first objection I have to raise is to the following phrase:—"A *moving* molecule of inorganic matter does not *possess* mind or consciousness; but it *possesses* a small *piece* of mind-stuff". I presume Prof. Clifford here means that the mental eject corresponding to the motion of a molecule of inorganic matter is not a *conscious* one; but his proposition, in the way he states it, implies that each molecule carries about with it in its travels something that would still be attached to it if it ceased to move. Here lies a fallacy. Prof. Clifford seems to have forgotten his own statement that the *motion* of matter is the concomitant of the ejective fact.

The same fallacy lurks in the subsequent argument. The supposition is made "that I see a man looking at a candlestick". A "cerebral image" is formed in the neighbourhood of his optic thalami. "This cerebral image is a certain complex of *disturbances* in the matter of these organs"; and yet we are told in the next breath—"Both the candlestick and the *cerebral image* are *matter*". Here again is the fallacy. The cerebral image is not matter but a complex of molecular *movements*—an important distinction.

Prof. Clifford then proceeds to point out that, besides the cerebral image and the candlestick, there are a mental image and an external reality, and that "the external reality bears the same relation to the mental image that the (phenomenal) candlestick bears to the cerebral image". So far all is well. But now Prof. Clifford repeats the fallacy above-mentioned, *viz.*, that "the candlestick and the cerebral image are both matter; they are made of the same stuff". But even apart from this objection, his conclusion—"Therefore the external reality is made of the same stuff as the man's perception or mental image, that is, it is made of mind-stuff"—does not follow at all. This will be seen more clearly if we put the argument in symbolical language:—

Let A = the external reality,
B = the candlestick, or my perception of the external reality,
C = the man's cerebral image as a possible perception of mine,
D = the man's mental image.

Then as B : C : : A : D; and therefore B and C being made of the same stuff (matter), A and D are also made of the same stuff (mind). The general proposition implied is that, if the same relation subsists between any two things, A and D, as subsists between two others, B and C, then, if C is made of the same stuff as B, D must be made of the same stuff as A, or *vice versâ*. This general proposition Prof. Clifford does not attempt to prove, though it stands in need of proof.

Again, even if the general proposition were true, it does not apply here, because B and C are *not* made of the same stuff, one being *matter* and the other *motion*.

The only tenable conclusion that Prof. Clifford can, in my opinion, arrive at, is that (quoting his own words), "as the cerebral image represents imperfectly the candlestick, in the same way and to the same extent the mental image represents the reality external to his consciousness". In other words, the agreements and differences obtaining in consciousness correspond to agreements and differences obtaining in a world outside (or rather independent of) consciousness.

Jno. T. Lingard.

The Foundation of Arithmetic.—"Wherein (asks Mill) lies the peculiar certainty always ascribed to the sciences" of Geometry and Arithmetic? "Why are they called the Exact Sciences? Why are mathematical certainty and the evidence of demonstration common phrases to express the very highest assurance attainable by reason? Why are mathematics . . . considered to be independent of the evidence of experience and observation, and characterised as systems of necessary truth?" The rational curiosity expressed in these queries will find small satisfaction in the answer of Mill, who replies that the "character of necessity ascribed to the truths of mathematics, and even, with some reservations, the peculiar certainty attributed to them, is an illusion; in order to sustain which it is necessary to suppose that those truths relate to, and express the properties of, purely imaginary objects".

Like most of those who have addressed themselves to this abstruse and complicated inquiry, he has encumbered his path by aiming at once at a general solution of the problem, and framing the discussion in terms intended from the first to meet the case of both demonstrative sciences. But the more abstruse is a subject, the easier it is for error to slip in under the cover of generalities, and it will greatly increase our chances of success if we confine our attention in the first instance to the more simple conception of Number, and afterwards turn, with whatever insight we may have obtained into the evidence of arithmetical certainty, to the more complicated relations of Position and Figure. The doctrine of Mill is, that Arithmetic, in the same sense as Mechanics or Optics, is an inductive science, resting on what are falsely called definitions, but are in reality generalisations from experience, inasmuch as they are to be understood, not merely as propositions explaining the meaning of the names Two, Three, Four, &c., but also as covertly assuming the existence of real things corresponding to such a meaning. "We may call 'Three is two and one' a definition of Three; but the calculations which depend on that proposition do not follow from the definition itself, but from an arithmetical theorem presupposed in it, *viz.*, that collections of objects exist, which while they impress the senses thus °o°, may be separated into two parts, thus oo o. This proposition being granted, we term all such parcels Threes, after which the enunciation of the above-mentioned physical fact will serve also as a definition of the word Three."

The truth of the covert assertion thus implied in the definition of each specific number is a truth "known to us by early and constant experience, an inductive truth; and such truths are the foundation of the science of Number. The fundamental truths of that science all rest on the evidence of sense; they are proved by showing to our eyes and our fingers that any given number of objects, ten balls for example, may by separation and rearrangement exhibit to our senses all the different sets of numbers the sum of which is equal to ten".

Thus, according to Mill, the way in which we learn that the addition of a fresh ball to a group of two will produce a group of three and not of four, or that a group of four things may always be divided into two groups of two each and not into a group of two and one of three, is by inveterate experience only—by constant observation of the result when groups of actual objects are so combined and decomposed, just as we learn that sugar is sweet or snow cold. The bare statement of such a conclusion in reference to numbers within easy grasp of the imagination should be sufficient to show that there must be some secret flaw in the reasoning which leads to so glaring a paradox. The source of the confusion in the mind of Mill may be traced to his fundamental doctrine "that no definition is ever intended to explain and unfold the nature of a thing". "All definitions are of names, and names only; but in some definitions it is clearly apparent that nothing is intended except to explain the meaning of the word; while in others, besides explaining the meaning of the word, it is intended to be implied that there exists a thing corresponding to the word." Definitions of this latter description consist of two parts; first, a proposition enouncing the meaning of the term defined, "which gives information only about the use of language, and from which no conclusions affecting matters of fact can possibly be drawn," and secondly, a covert postulate affirming "the real existence of things possessing the combination of attributes set forth in the definition," a fact which may lead to consequences of every degree of importance, and, if true, may be sufficient on which to build a whole fabric of scientific truth.

Now in the first place it cannot be admitted that definitions are of names only and never of things, that no definition is ever intended to unfold the nature of a thing. Whenever the word to be explained is the name of a thing of which the person to be instructed has no previous knowledge, the meaning can only be conveyed by explaining the nature of the thing signified. I explain the meaning of the word dragon, for example, to a person who has no conception of such an animal, by the definition—A dragon is a serpent which breathes flame; from which he will learn at the same time the meaning of the word dragon and the nature of the thing signified, without reference to the question whether such a creature actually exists or ever has existed or not. The hearer, who takes his notion of a dragon from this definition, will see *à priori* that every possible dragon must be a serpent and must breathe flame, because what he understands by a dragon is a creature characterised by the combination of those attributes; and if ever a dragon is to be found in actual existence, it must necessarily be by the apprehension of both the attributes in question.

In the same way it will be seen that every definition, rightly understood, must necessarily hold good of everything signified by the term defined, that is to say, that everything comprehended under that designation must inevitably be possessed of the character detailed in the predicate of the definition, because it is only by the exhibition of that character that it is made an example of what is signified by the term defined. Thus every definition, after it has performed its primary duty of indicating the sense in which the term defined is to be understood, will, when converted into an universal proposition, be recognised as a necessary truth, provided that the subject of the proposition, so understood, affords room for the question of the truth or falsehood of assertions concerning it. If no such thing as a dragon is to be found in the world, it cannot be said that the proposition, Every dragon breathes flame, is either true or false. It is manifest, however, that the real existence of things signified by the term defined can be secured by no postulate or assumption, but only by positive knowledge of some individual in actual existence. The condition, then, which converts the definition of a dragon from an exposition of the meaning of a word into an assertion of positive fact will be no assumption of the real existence of serpents breathing flame, but the discovery of an animal so characterised in actual existence.

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Whether the definition is to lead to a real advance in knowledge, or to remain a barren explanation of what is denoted by a certain term, must depend upon the question whether or no it is possible to deduce from it any attribute of the species defined that must not itself be directly apprehended in the recognition of an individual of the species in actual existence. If it could be shown that the notion of some ulterior attribute, not necessarily present to the mind in the conception of a serpent breathing flame, such for instance as the notion of carrying a hidden jewel in its head, was logically involved in the conception of a dragon, it would be manifest to those who followed the demonstration, that every actual dragon (if such there were in existence) must necessarily carry a jewel in its head, and the insight into that necessity, on the occurrence of an actual dragon, would give knowledge of a fact not directly perceived in the apprehension of that particular animal. But no conclusion of such a nature can be drawn from the definition, from which it can only be inferred that every dragon is a serpent and that it breathes flame; both of which propositions, to one who takes his conception of a dragon from the definition, are manifest truisms.

On the other hand the conclusions of Arithmetic confer a real advance in knowledge, because they predicate conditions of this or that particular number, which are not necessarily brought before the mind in the mere course of the operation by which the subject of the conclusion is recognised in actual existence. If each successive member of the series, one, two, three, four, &c., is defined by the continual addition of one to the preceding number, it will be easy to show from the definitions that any given number is the aggregate of various combinations of inferior numbers; that the number thirteen, for example, is the aggregate of seven and six, and the knowledge of this relation, in the mind of a person who is acquainted with an actual group of thirteen things, will show him with absolute certainty that that particular group may be broken up into a group of seven and one of six; a fact not necessarily made apparent in the mere numeration of the group of thirteen.

In our system of instruction Arithmetic is taught as an art and not as a science. The propositions of the addition and multiplication tables are given out as the tools with which the scholar is to work, without any attempt to deduce them from a logical analysis of the numbers themselves. But that is because Arithmetic is taught at so early an age that it is more important to fix the elementary relations of number in the memory of the scholar than to educate his power of speculative thought, and not from any inherent difficulty in a complete demonstration.

Number is the attribute apprehended by the process of counting, which consists in the recognition of successive objects as things of a certain kind, taking note, at the recognition of each fresh individual, of the extent to which the repetition of the kind has been previously carried. When the attention is simply directed to the fact of repetition, without distinguishing the degree to which it has been carried, the aggregate series is conceived as consisting of *many* things of the kind in question, and the contrast between the aggregate object apprehended in such a manner and that to which attention is directed at each repetition of the kind, gives rise to the conception of the latter as *individual* or *one.* Thus the idea of unity consists in a mental reference to the possibility of repetition of the kind to which the object is referred, or, what amounts to the same thing, in the negation of actual repetition, the negative character of the idea being witnessed by the form of the word *individual*—what is not broken up or divided into many. We should never have conceived an object as *one* unless we had previously had experience of something apprehended as *many*, but as soon as the notion of *one* has been evolved or abstracted in the way above-described, we see that *many* consists of one and one and one, and so on, until the entire group has passed under review. It is this relation between the ideas of plurality and unity which is expressed by Cousin under his somewhat mystical formula of the two contrasted orders of ideas; in the order of Time, he says, the idea of unity presupposes that of multiplicity, but in the order of Reason, multiplicity presupposes unity.

The lowest degree of plurality is where there is a single repetition of the kind; where a group consists of one object and one other of the same kind. The numerical character of a group of this nature is designated by the term Two, which may accordingly be defined by the proposition

Two is the aggregate of one and one, or, compendiously,
Two is one and one.

Our conviction that one and one are two, does not arise from uniform experience that a group of two things may always be decomposed in the form of one and one, but from consciousness, on the contemplation of our own thoughts, that what we mean by *two* is nothing else than the aggregate of one and one. In apprehending a group as consisting of two things, we do but bring under review at a single glance the elements which have been apprehended, in however transitory a manner, as one and one.

Having thus attained to the conception of the number two, we may imagine the addition of another unit to an ideal group of two, which will thus be enlarged to an assemblage of one and one and one, presenting to the mind the fundamental aspect of the number designated by the name of Three.

In like manner the mental association of an additional unit with a group of three will constitute a group of one and one and one and one, to which we give the name of Four, and so, by the addition of one to the highest number of which we had previously formed a definite conception, we might continuously advance to the conception of a number one degree higher, so long as we were able to keep accurate count of the precise amount of repetition by which that particular step in the numerical scale was characterised. But such a limit, without some artificial aid of the memory, would very speedily be reached, and in the lowest stage of mental cultivation would probably not be placed beyond the number three or four. The requisite aid, however, is not far to seek, and is found by all the families of man in the quinary division of the hand, the fingers of which afford a ready scale on which to tell off the units of any group, up to five, of which one might wish to take count. Thus beginning with the thumb of the left hand, the first finger would mark a single repetition of the kind under enumeration, or a second member of the group; the middle finger a second repetition, or a third member of the group, and in this way primitive man would learn to associate a definite amount of repetition with each of his fingers, and might attain to a clear conception of the first five numbers antecedent to the use of any vocal designation. But sooner or later the demands of language would give rise to the use of spoken names, one, two, three, four, five, denoting the numbers told off on each successive finger; and these, being constantly repeated in regular order, constitute a series so rooted in the memory that each name serves at once to bring before the mind the preceding portion of the series, and thus affords a standard of the extent of repetition to which it corresponds, as distinct as that supplied by the fingers passed over in telling numbers on the hand. When the fingers on one hand are exhausted, we may either go through a second series with names of the form five-one, five-two, five-three, &c., which are actually found in many rude dialects, or the higher numbers may be told off on the other hand with a fresh set of names, six, seven, eight, nine, ten, corresponding to the fingers of the second hand.

When the ten digits are exhausted, we advance, by the continued addition of one, to the conception of higher numbers under designations of the form, ten-one, ten-two, &c.; two-tens, two-ten-one, &c.; three-tens, &c.; ten-tens, ten-ten-one, &c.; and so on, to an indefinite extent, using the convenience of compendious names for such of the powers of ten as may be convenient for resting-places in the process of numeration.

The composition of such a system of numbers is enounced in the following definitions:—

(2) Two is the aggregate of one and one, or, shortly,
Two is one and one.
(3) Three is two and one, &c.
(11) Eleven is ten and one, &c.
(20) Twenty is ten and ten, or two tens, &c.
(100) A Hundred is ten tens, &c.

By reference to these definitions the numerical value of all arithmetical expressions may be ascertained or compared with each other, because the definitions afford the means of reducing each of the systems in question, when necessary, to its constituent units, or of building it up out of them, and thus of ticking off against each other the systems to be compared, unit by unit. To show, for example, that seven and six are thirteen, we have, by defn. (8),

Seven and one are Eight.

Adding one to each side,

Seven and one and one are Eight and one,

Or, by defns. (2) and (9),

Seven and two are Nine.

Adding one again,

Seven and two and one are Nine and one,

Or, by defns. (3) and (10),

Seven and three are Ten.

And so on, till we come to

Seven and six are Thirteen.

As the number of a set of things depends exclusively upon the length of the series, one and one and one, &c., where each 'one' of the series answers to an individual of the enumerated class as it is successively brought under review in the process of counting, without reference to any difference between one individual and another, it is plain that the aggregate number of the class can in nowise be affected by the order in which the individuals of the series are counted. If I have a series of balls, black, white, green, and red, the aspect under which I regard them in counting will be, one and one and one and one, whether I take them in the order of black, white, green, red, or of red, green, white, black. And so, if I jumble together a set of (m) white balls and a set of (n) black ones, the tale of the whole will be the same, whether in counting I pick out first the white and then the black, or first the black and then the white. In other words, the sum made by the addition of (n) to (m) is the same as that made by the addition of (m) to (n), or algebraically,

$$m + n = n + m.$$

In a similar way it may be shown that the product of two factors (m) and (n) is independent of the order in which the factors are taken; that (n) times (m) is the same as (m) times (n); or algebraically that $nm = mn$.

Suppose that we have five groups of seven balls each, it is obvious that the number will be seven times as great as if there were only one in each group, when the number would be only five in all; so that five times seven is the same as seven times five. Or to take the question more in detail, let the balls of each group be marked 1, 2, 3, &c., 7. Then there will in the aggregate be five ones, five twos, &c., and five sevens; making seven sets of five each. Thus it appears, from the nature of the conception, that things which are known as making five groups of seven each may be otherwise arranged in seven groups of five each, or, in other words, that five times seven is equal to seven times five.

If now we look back for a summary answer to the inquiry with which we set out, we find that our assurance in the universal truth of Arithmetic arises from seeing that the numerical equations which form the body of the science are necessary consequences of the fundamental constitution of the numbers in question, as distinguished in thought or apprehended in actual existence.

The conception of every phase of Number consists, as we have seen, in a reference, more or less explicit, to a succession of units of definite length, wholly independent of the nature of the enumerated objects; and the demonstration of the numerical equation consists in showing, from the essential constitution of the numbers concerned, that the units contained in the combination on one side of the equation may be otherwise arranged in the groups indicated by the numbers on the other side. We show, for instance, that 7 times 8 is 56 by taking the units contained in 7 rows of 8 each, and showing, from the definitions, that they may be arranged in 5 rows of 10 each and one of 6. We find, from a gradual decomposition of the conceptions, that the mental operation, by which we enumerate the aggregate of seven groups of eight each, whether of balls or books or anything else, is identical with that by which we enumerate a group of 56, and thus we know with absolute certainty that things which are given us in the form of seven lots of eight each may be enumerated under the form of fifty-six.

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HENSLEIGH WEDGWOOD.

IX.—NEW BOOKS.

Darwinism tested by Language. By FREDERIC BATEMAN, M.D., &c. With a Preface by Edward Meyrick Goulbourn, D.D., Dean of Norwich. London, &c.: Rivingtons, 1877. Pp. 224.

The author's special argument is imbedded in a number of observations on the doctrine of Evolution generally. He seeks to establish three positions: (1) that articulate speech is a distinctive attribute of man, the ape and lower animals possessing no trace of it; (2) that it is also a universal attribute, all races having either a language or the power of acquiring it; (3) that the faculty of speech is immaterial. This last proposition is opposed by the author to all the different attempts yet made to assign a local seat of speech in the brain: the pathological and other evidence, he maintains now, as he has maintained before, is dead against them all, Broca's included. The positive import of his proposition is thus disclosed :—"With these facts before me, I am tempted to ask whether speech, like the soul, may not be an attribute—an immaterial *nescio quid*, the comprehension of which is beyond the limits of our finite minds". He further declares for a spirit "or organ of God-consciousness" in man, which "differentiates him from the brute" possessing only a body and soul. Upon this it occurs to one to ask what Dr. Bateman means by "soul" in the earlier sentence. If he means all that is not body in man, he degrades the "spirit," with the animal life, into a mere "attribute"—which looks very like materialism. If, on the other hand, he means the kind of life we share with animals,—how, by comparing language therewith, does he establish its distinctively human character? And, once more, is it language or is it spirit ("the organ of God-consciousness") that we are to take as the really differential element in man's nature? Dr. Bateman is not a very careful reasoner or writer.

The Dean of Norwich, who stands forward as sponsor for the work, argues about Evolution in Dr. Bateman's general strain, only more pointedly.

General Sketch of the History of Pantheism. 2 vols. Vol. I. From the Earliest Times to the age of Spinoza. London: Deacon & Co., 1878. Pp. 395.

The anonymous author describes his work as "merely an outline or epitome of a history," and as "chiefly a compilation, taken more frequently from translations and abridgements of the originals than from the originals themselves". After compiling in regard to Oriental and Greek Pantheism and sketching, in a fashion of his own, "the paganisation of Christianity and consequent decay of Pantheism" as far as the Rise of Scholasticism, he passes by a sudden stride to Servetus, Bruno, and Vanini, and will resume with Spinoza. It cannot be said that he compiles with such discrimination as to justify his work.

Proteus and Amadeus: A Correspondence. Edited by AUBREY DE VERE. London: Kegan Paul & Co., 1878. Pp. 184.

A veritable correspondence, under assumed names, carried on in 1876 between two friends—twenty years before pupil and master in a Catholic College—on the Existence of God and the human Soul. Proteus, the pupil, had strayed into "materialism" and Darwinism, accepting them intellectually but unhappy over them. Amadeus seeks to maintain the old orthodox positions against the modern objections. In the end the pupil is more than shaken; Darwin, as he allows, having "been hewed to pieces" for him by the master's "and Mivart's sword," and even Evolution being "emasculated and left harmless henceforth for ever". But still he cannot quite come back to the fold.

On the Nature of Things. A Science Primer. By JOHN G. MACVICAR, A.M., LL.D., D.D. With Illustrations. Edinburgh and London: Blackwood & Sons, 1878. Pp. 112.

"This work is grounded on the belief of an Almighty Being possessing unity, omnipresence, and ever-blessedness, and awarding existence to a creation for the sake of manifesting Himself and extending blessedness beyond Himself, and, in a word, to be a mirror of Himself, so far as the finite can bear a likeness to the Infinite. After setting out with this cosmical law of *assimilation*, by its aid alone bearing on only one kind of created substance or energy ('mind-stuff'), the author deduces the creation of the world of Spirits, and as their home the Universal Ether or medium of light. Then, as a beautiful cloudwork in the azure of the Spirit World, he gives the genesis of Matter and the molecular system, culminating in this planet in the construction of the myo-cerebral organism, whose characteristic function is to construct a powerful tissue of organised ether or the matter of light, which, being unified in its focus of vital action into an element of energy so powerful as to have recovered the primal attribute of energy—namely, mental power—is a spirit. And thus creation, after a lapse into matter, becomes the mother and nurse of spirits again, destined, if the design of the Creator is fulfilled, to find a home in heaven, the realm of light, and there to experience the final fulfilment of the cosmical law of assimilation and be blessed for ever.

"The author, anticipating the criticism that all this is merely the fond imagination of one who disregards the now prevailing views of men of science, and who still clings to his theological education, has devoted more than half the volume to the verification of his theory by a detailed appeal to natural phenomena and experiments in physics and chemistry, which his theory enables him to deduce and account for, but which the most recent speculations in the science of the day leave still in the dark."

Comparative Psychology; or, The Growth and Grades of Intelligence. By JOHN BASCOM. New York: Putnam's Sons, 1878. Pp. 297.

The author in his preface says:—

"Without tracing the history of intelligence, we are not prepared to decide what is primitive and what is acquired, what is original material and what is the deposit of growth. The empiricist cannot be fully and fairly met without travelling with him these spaces of evolution, and determining at least their general character and laws. This I have undertaken in the present volume. It is my purpose to test the nature and extent of the modifications put upon human psychology by its relations in growth to the life below it, and in doing this to reach a general statement of each stage of development. . . . . I have derived great benefit from many forms of the Empirical Philosophy: these I cheerfully acknowledge, while I must remain its unflinching adversary. The Intuitional Philosophy can and should appropriate these excellent fruits, and this volume is the result of such an effort."

The Balance of Emotion and Intellect: An Essay introductory to the Study of Philosophy. By CHARLES WALDSTEIN, Ph. D. London: Kegan Paul & Co.

"The title of this forthcoming Essay indicates that it is meant to form an introduction to the study of philosophy. Its object is to contribute to the development of the philosophical attitude of mind. The author first attempts to counteract prevailing fallacies with regard to the false opposition of Emotion and Intellect, Common and Scientific Thought, the Exact Sciences and Philosophy. He then gives a short Sketch of the History of Philosophy."

Moralische Briefe. Von A. HORWICZ. Magdeburg: Faber, 1878. Pp. 126.

The author of *Psychologische Analysen* here appears in the character of a censor, exposing the sores of the German body politic, and only not despairing of his country's future. The Germans, he declares, are suffering from "blue-devils," manifested especially in the socialistic madness. The follies and affectations of fashion have laid hold on men and women alike. Trade and industry are vitiated by deception and sham. And while a gross materialism is the only creed of the masses, true culture in the higher grades is becoming ever more rare. The socialistic movement, fraught to the author's imagination with all evil, he considers the natural outcome of the political and religious radicalism and scepticism which the masses have by this time learnt from the reckless outpourings of writers like Heine, Börne, &c. in a former generation. (He does not, apparently, connect it all with the oppressive military system and the unhinging effect of wars.) At the end he gives practical recommendations for the development of the civic virtue that he finds wanting, and in these there is much wisdom. Especially striking, and even powerful, is his statement of the individual's relation to society (§ 7).

Hegel und die logische Frage der Philosophie in der Gegenwart. Von CONRAD HERMANN. Leipzig: Schäfer, 1878.

"Hegel's logic was admired in its time as one of the greatest productions of the human mind. Since then there has been a reaction in favour of the common or formal logic of Aristotle. The present book is an attempt to carry out farther the thought of the Hegelian logic on a changed and improved basis. The whole position of Hegel in the history of modern philosophy is, in the author's view, analogous to that of Plato in antiquity. Just as Plato's logical doctrine attained its higher development in Aristotle's, so (the author thinks) does Hegel's point to a higher truth of philosophy and scientific use of the thought-principle."

GIACINTO FONTANA: *L'Epopaea e la Filosofia della Storia.* Mantova, 1878.

This book is a sequel and supplement to the *Idea per una Filosofia della Storia*, published by the author two years ago, and noticed in MIND V. History is viewed by him as either the progressive apprehension or the progressive realisation of the Idea or Absolute Being,—the development either of a contemplative or of an active principle. The former is to be studied in the history of religion and of science, the latter in the history of art, industry and commerce. The true philosophy of history he believes to be that which flows from the general philosophy of Plato, Vico and Mamiani. His admiration of it is intense, but his delineation of it is vague. He has, however, a wide knowledge of historical phenomena and the power of eloquently describing. On this account the present work is valuable, although it does not directly contribute much, perhaps, to the advancement of the philosophy of history. Its general aim is to show that in the history of epic poetry there are to be traced a humanitarian evolution of the Absolute and a progress both of intelligence and of liberty, both of the contemplative and the active principle; the priestly or hieratic class of epics corresponding to the former and the martial or warrior class to the latter. In the first four chapters the phantasy, the beautiful, the sublime, the ideal in primitive poetry, and the heroic in primitive poetry, are the subjects discussed. The following chapters have more special themes, namely, the Râmâyana, the Mahâbhârata, the Greek epics, the Latin epics, the cycles of (mediæval) Christian poetry, the epic cycles of paganism as influenced by Christianity, the Shahnameh, the ideal in art at the epoch of the Renaissance, the romantic poems, and modern Christian epic poetry. The last chapter treats of the relation of epic poetry to the philosophy of history. The work is one which the general reader is sure to find both interesting and instructive.

R. F.

CARLO CANTONI: *Giuseppe Ferrari.* Milano, 1878.

This is a memoir read before the Institute of Lombardy. It commemorates the character and services of a man who has secured for himself a permanent place in the history of Italian philosophy. Scepticism has had few more subtle or thorough representatives than the late Signor Ferrari. Although he held many strange philosophical and political opinions and wanted sobriety of judgment, he was a man of most original and vigorous genius, an indefatigable labourer in the cause of science and progress, and the author of many learned, ingenious and brilliant works. Italy may justly cherish his memory with gratitude and pride. In this memoir the history of his outward life is clearly narrated, his character is sympathetically and judiciously delineated, and almost every work he wrote is summarised with great skill and judged with great equity. Signor Cantoni has admirably performed the duty devolved on him. It will interest those who are acquainted with his work on Vico, on the whole the best which has been written on the great Neapolitan, and his *Elementary Course of Philosophy*,—a book which if well translated would be very useful to students and teachers,—to learn that he is at present engaged on a Critical Exposition of the Philosophy of Kant, soon to appear in two volumes.

R. F.

X.—NEWS.

Mr. Grant Allen has nearly completed a volume for Messrs. Trübner on *The Colour-Sense, its Origin and Development.* He seeks to trace the causes and reactions of the colour-sense in insects, fishes, reptiles, birds, and mammals, and criticises adversely (as he has already shortly done in MIND IX.) the "historical development theory" of Magnus. Magnus's tractate has just been translated into French, with an introduction by M. Jules Soury (Germer Baillière).

Miss Hopkins is about to publish with Messrs. Kegan Paul & Co. a collection of the late James Hinton's Essays, uniform with the lately published *Life and Letters.*

Mr. Herbert Spencer has been made a Foreign Associate of the Accademia dei Lincei.

The statue-model by M. Frédéric Hexamer of Paris has been selected by the Spinoza Committee at the Hague from among those sent in for the second competition (which had become necessary), and the artist is now commissioned to prepare one on a larger scale.

THE JOURNAL OF SPECULATIVE PHILOSOPHY. Vol. XII., No. 2. J. Watson—'The World as Force'. Von Hartmann—'The true and false in Darwinism' (transl.). Hegel—'Of the Classic form of Art' (transl.). Fichte—'Criticism of Schelling' (transl.). F. A. Henry—'Christianity and the Clearing-up'. Schelling—'The Historical Construction of Christianity' (transl.). Notes and Discussions. Book Notices. No. 3. J. E. Cabot—'Some considerations on the notion of Space'. W. James—'Brute and Human Intellect'. Hegel—'Of the Ideal of Classic Art' (transl.). Rosenkranz—'The Form and the Limits of Education' (paraphrased from Rosenkranz's *Pedagogics as a System*). Fichte—'Criticism of Schelling' (transl.). Notes and Discussions.

REVUE PHILOSOPHIQUE. 3me Année. No. VII. G. Compayré—'Origines de la Psychologie evolutionniste: La psychologie de Lamarck'. T. V. Charpentier—'La Logique du Hasard, d'après John Venn'. D. Nolen—'Les nouvelles philosophies en Allemagne'. Notes et Documents—'Le sens musculaire, d'après G. H. Lewes'; P. Tannery, 'Essais sur le Syllogisme, I. Les trois figures'. Analyses et Comptes-rendus. Rev. des Périod. No. VIII. H. Spencer—'Études de Sociologie' (fin). Th. Ribot—'Les théories allemandes sur l' Espace tactile'. T. V. Charpentier—'La Logique du Hasard, d'après John Venn' (fin). Analyses et Comptes-rendus (Ferrier, *Lectures on Cerebral Localisation*, &c.). Rev. des Périod. No. IX. W. Wundt—'Sur la theorie des Signes locaux'. N. Grote—'Essai d' une classification nouvelle des Sentiments'. F. Paulhan—'La théorie de l' Inconnaissable de H. Spencer'. Notes et Documents—V. Egger, 'Les *lapsus* de la Vision'; P. Tannery, 'Application de l' Algèbre au Syllogisme'. Analyses (Flint, *Theism*, &c.). Rev. des Périod.

LA CRITIQUE PHILOSOPHIQUE. VIIme Année, Nos. 20-32. C. Renouvier—'L' appreciation des degrés de culpabilité' (20); 'Le principe de contradiction, le principe de l' inconcevable et la thèse du premier commencement' (21); 'Examen critique des principes de psychologie de H. Spencer: classification, &c.' (22), 'La question de la certitude' (24), 'La volonté' (25); 'La question de la certitude: Les postulats et le libre arbitre' (31), 'Le libre arbitre fondement de la certitude' (32). F. Pillon—'Frédéric Bastiat' (23, 31, 32). Bibliog. (Lafitte, *La Revue Occidentale* (26)).

LA FILOSOFIA DELLE SCUOLE ITALIANE.—Vol. XVII., Disp. 3. G. Barzellotti—'La critica della conoscenza e la metafisica dopo il Kant'. C. Cantoni—'G. M. Bertini' (II.). P. Ragnisco—'Le cause finale in Platone e in Aristotele'. J. C. Doni—'Del Coraggio'. Bibliografia, &c.

ZEITSCHRIFT FÜR VÖLKERPSYCHOLOGIE U. SPRACHWISSENSCHAFT.—Bd. X., Hefte 2, 3. F. Misteli—'Einiges zur Casuslehre'. M. Holzmann—'Der sogenannte Locativ des Zieles im Rigveda und in den homerischen Gedichten'. G. v. der Gabelentz—'Ein Probestück von chinesischem Parallelismus'. Beurtheilungen (Kussmaul, *Störungen der Sprache*, &c.). Br.—'Nachträge zur Lehre vom Stottern'. H. Steinthal—'Anmerkung'.

PHILOSOPHISCHE MONATSHEFTE.—Bd. XIV., Heft 6. Baumann—'Kurze Darstellung der Philosophie Franz v. Baader's'. Recensionen und Anzeigen (Tobias, *Grenzen der Philosophie*; Spir, *Denken u. Wirklichkeit*; Eucken, *Gesch. u. Krit. der Grundbegriffe der Gegenwart*; Pfleiderer, *Die Idee eines goldenen Zeitalters*; Spitta, *Die Schlaf u. Traumzustände der mensch. Seele*; Binz, *Ueber den Traum*. Literaturbericht (Sir A. Grant, *Aristoteles* (übers.), &c.). Bibliographie, &c. Heft 7. C. Schaarschmidt—'Zur Widerlegung des subjectiven Idealismus'. Recensionen u. Anzeigen (Cohen, *Kant's Begründung der Ethik*; Ueberhorst, *Die Entstehung der Gesichtswahrnehmung*; v. Stein, *Ueber Wahrnehmung*; Baeumker, *Des Aristoteles-Lehre von den äussern u. inneren Sinnesvermögen*; Pivány, *Entstehungsgeschichte des Welt- u. Erdgebäudes u. der Organismen)*. Bibliog.

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